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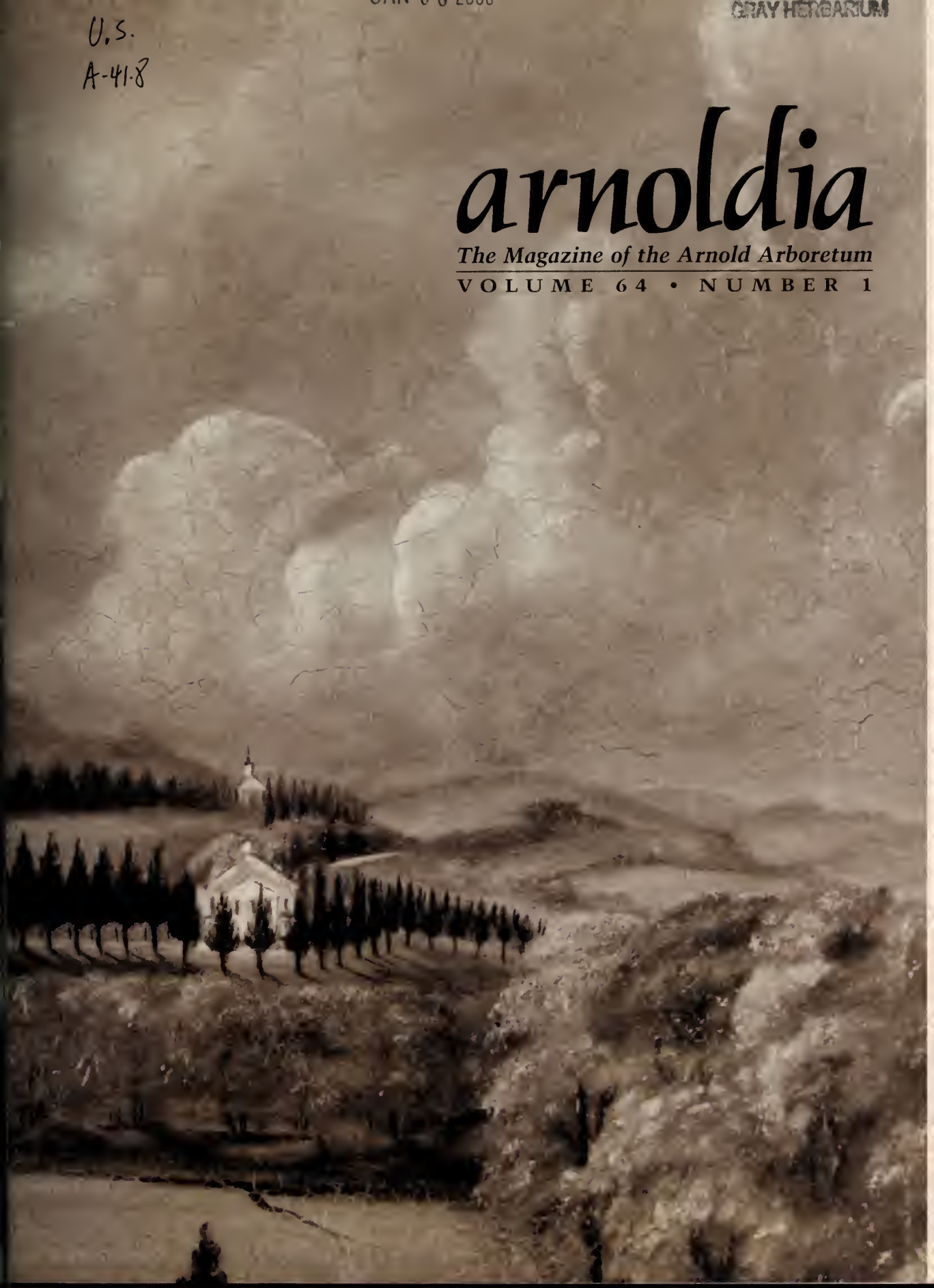
GRAY HERBARIUM

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# arnoldia

*The Magazine of the Arnold Arboretum*

VOLUME 64 • NUMBER 1







U.S.  
A-41.8

JAN 06 2006

GRAY HERBARIUM

# arnoldia

Volume 64 • Number 1 • 2005

*Arnoldia* (ISSN 004-2633; USPS 866-100) is published quarterly by the Arnold Arboretum of Harvard University. Periodicals postage paid at Boston, Massachusetts.

Subscriptions are \$20.00 per calendar year domestic, \$25.00 foreign, payable in advance. Single copies of most issues are \$5.00; the exceptions are 58/4-59/1 (*Metasequoia After Fifty Years*) and 54/4 (*A Source-book of Cultivar Names*), which are \$10.00. Remittances may be made in U.S. dollars, by check drawn on a U.S. bank; by international money order; or by Visa or Mastercard. Send orders, remittances, change-of-address notices, and other subscription-related communications to Circulation Manager, *Arnoldia*, Arnold Arboretum, 125 Arborway, Jamaica Plain, Massachusetts 02130-3500. Telephone 617.524.1718; facsimile 617.524.1418; e-mail [arnoldia@arnarb.harvard.edu](mailto:arnoldia@arnarb.harvard.edu).

**Postmaster:** Send address changes to  
*Arnoldia* Circulation Manager  
The Arnold Arboretum  
125 Arborway  
Jamaica Plain, MA 02130-3500

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**Outside covers:** Seat of Benjamin Bussey, Esq., at Jamaica Plain. Oil on canvas by William Cobb, 1839. This landscape includes the areas of the Arnold Arboretum that have come to be known as Bussey Hill, Hemlock Hill, and the South Street Tract. South Street is plainly visible, and it is easy to see where Sawmill Brook—now Bussey Brook—crosses it. The Bussey mansion appears in the middle ground. Bussey had begun buying up farmsteads in 1805 and continued to do so over the next thirty years. Some of the hedgerows that delineated the separate parcels appear in the painting. On the south slope of the hill, a lilac hedge, still extant today, formed one of these boundaries. This view of the Arboretum from Walk Hill, near the Forest Hills transit station, remains virtually unchanged today. From the Archives of the Arnold Arboretum, Harvard University.

**Inside front cover:** Clockwise from top left, gray catbird fledgling in a red osier dogwood near Faxon Pond; Baltimore oriole and nest in a cottonwood tree on Peters Hill; orchard oriole fledgling and nest, which is tethered to a crabapple on Peters Hill; young eastern kingbirds; great crested flycatcher in nest on Peters Hill.

**Inside back cover:** Clockwise from top left, Baltimore oriole in the nest in a red maple near Faxon Pond; young eastern kingbird in a catalpa at the bottom of Bussey Hill Road; eastern kingbird nesting in a Kentucky coffeetree near the ponds on Meadow Road; great horned owl perched in a favored species—white pine—on Bussey Hill not far from the South Street gate; female boblink bearing food, resting on a hawthorn on Peters Hill.

# Benjamin Bussey, Woodland Hill, and the Creation of the Arnold Arboretum

Mary Jane Wilson

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The Arnold Arboretum was officially established in March 1872, when an indenture was signed by which trustees of a bequest of James Arnold agreed to turn the fund over to Harvard College, provided the college would use it to develop an arboretum on land bequeathed earlier by Benjamin Bussey . . . An intense regard for the land and for agricultural endeavor led Bussey to leave a large portion of his fortune and all of his property in West Roxbury to Harvard College for the creation of an institution for instruction in farming, horticulture, botany, and related fields.

—Ida Hay, *Science in the Pleasure Ground*

The following is adapted from the first full-length life of Bussey, soon to be published in its entirety.

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I first met Benjamin Bussey when I opened an old family box labeled "Important Papers—Save." Inside I found more than two hundred documents, primarily letters written in the early 1800s, addressed to a Benjamin Bussey of Boston. It appeared that Bussey was a man of importance in Federalist New England and that here was a story to be told. My research confirmed that, indeed, Bussey was an outstanding New Englander. The letters found in that box have allowed me to piece together Benjamin Bussey's life and encouraged the telling of his story. May history better remember and recognize this extraordinary man who bettered the world in which he lived and whose legacy remains today in a most special way, enhancing the lives of untold others, through the Arnold Arboretum.

Benjamin Bussey (1757–1842) played an important role in the growth of commerce, manufacturing, and agriculture in New England. After a childhood of frugal living and hard work and a soldier's travails in the American Revolution, he became a merchant, eventually amassing a great fortune from European trade. He was also on the cutting edge of New England's manufacturing industry, with woolen mills in Dedham,

Massachusetts, that introduced the water-driven Broad Power Loom to America. Throughout his life he was a benefactor to many individuals as well as to religious and civic organizations.

As a farmer Bussey acquired vast tracts of land from Boston, Massachusetts, to Bangor, Maine. At his country estate, Woodland Hill, he demonstrated his support for the new movement called "scientific farming." His sponsorship of agricultural education, "remarkable in its foresight,"<sup>1</sup> led to his bequest to Harvard College of Woodland Hill for a school of agriculture and horticulture. Harvard honored his bequest in 1869 with the creation of the Bussey Institution.

The years have obscured his name. His mills in Dedham are gone, his properties in Maine in great part absorbed by the city of Bangor. Only traces of his life remain in the landscape: a street bearing the Bussey name in Dedham and a hilltop and a brook named for him at the Arnold Arboretum.

Bussey had accumulated a great fortune by the early 1800s. Around the same time, a combination of embargos, falling markets, and failing enterprises made the shipping business

less attractive, and he retired from the merchant life. Five Summer Street in Boston had been his home since 1798. The property included a mansion with grounds and gardens and a carriage house for the family's horses and vehicles. In 1806 he purchased the farm of Eleazer Weld, located in what was then known as West Roxbury, now the Jamaica Plain/Forest Hills section of Boston, an area popular for country seats and summer relaxation. Several of Bussey's friends had already established country estates. Joseph Barrell built Pleasant Hill in Charlestown in 1791; Theodore Lyman, The Vale in 1793 in Waltham; and John Codman renovated the Russell estate in Lincoln in 1797. These gentlemen farmers used new experimental methods to develop their lands. In 1792, twenty-one lawyers, doctors, politicians, and merchants chartered the Massachusetts Society for Promoting Agriculture (MSPA). The Society acquired and disbursed information on crop rotation, reforestation, and the use of cattle to provide natural fertilizer. Bussey joined the Society in 1803.

At this point in his life Bussey was virtually free to devote his time to managing his investments and his real estate. His son and daughter were grown and on their own: Benjamin III had graduated from Harvard and Eliza had married. Developing his estate was now the major focus of his life, becoming both an experiment in developing his interest in scientific farming and an outlet for the attachment to the land that had formed in his childhood and progressed to ornamental gardening at the Summer Street residence. The spacious meadows, hills, and brooks, and the excellence and variety of the Jamaica Plain landscape spoke to his agrarian nature. Wood-

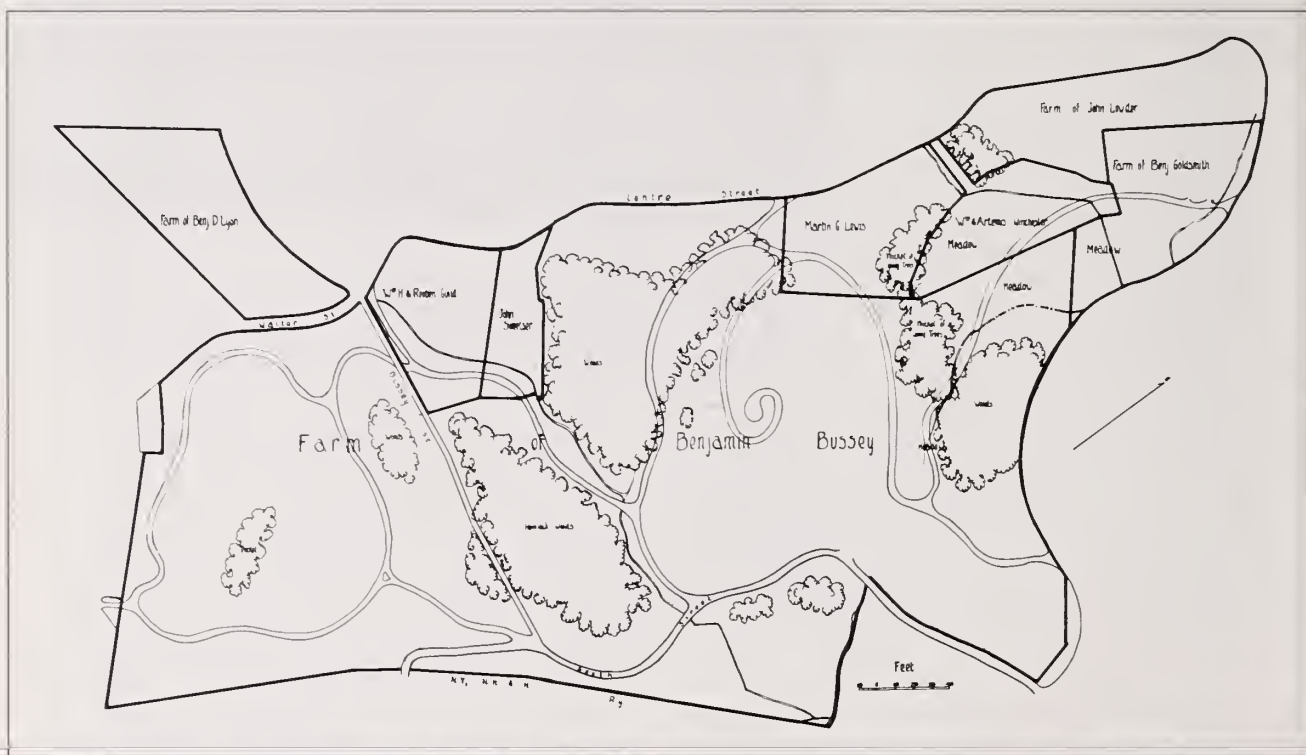
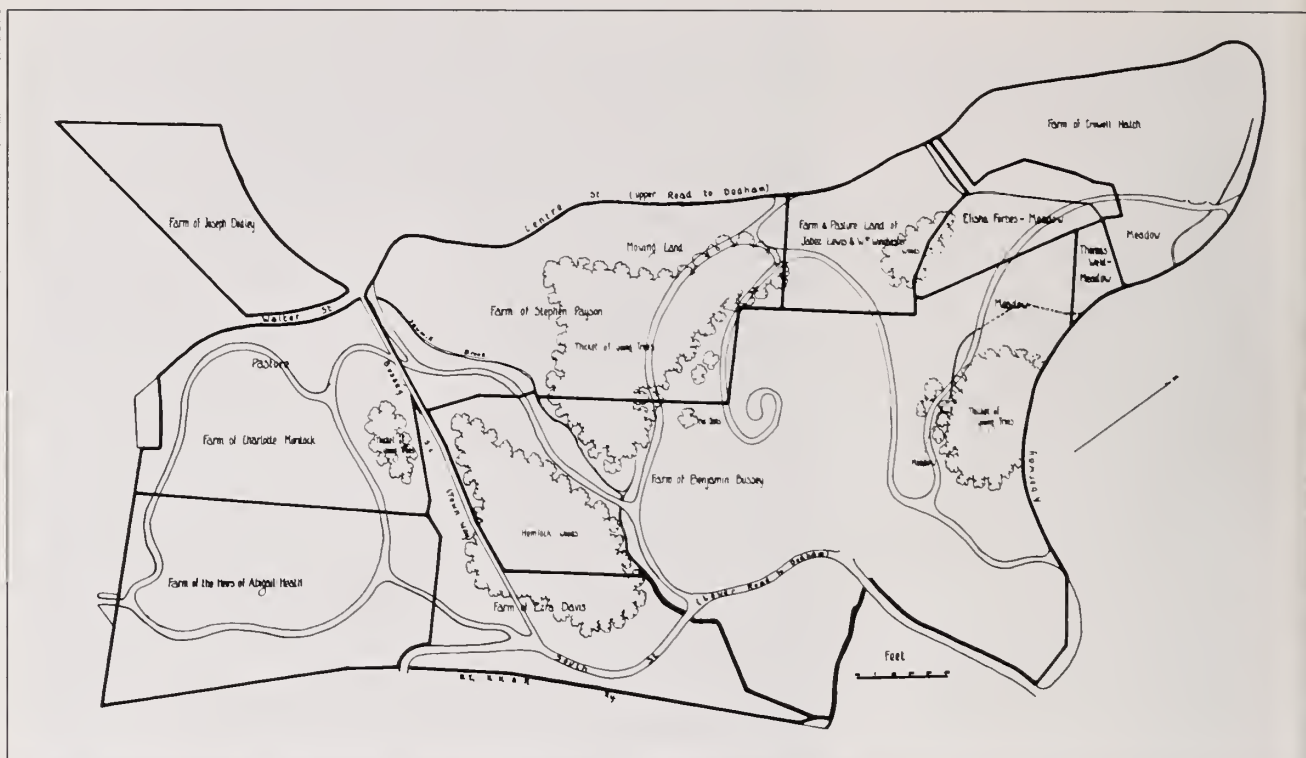


*In 1808 Bussey made arrangements with the famed portraitist Gilbert Stuart to paint the family's portraits. Bussey's own was the last to be finished. Reporting on its progress after a visit to Stuart's studio, daughter Eliza wrote to her mother, who was with Benjamin in Bangor, "It is the very image of himself and the pleasure I have in viewing it lessens the pain of our separation for I feel as tho' in his presence when I look at the portrait."*

land Hill would eventually grow to encompass more than three hundred acres.

Bussey immediately assumed management of the farm operations. Farmhands were hired and a woman, Anna Sherman, was employed to watch over the farmhouse needs. The land was plowed and planted with new products such as Liberian wheat, and outbuildings were erected, including a barn to house the livestock, cattle, swine, and the newly introduced merino sheep. He also targeted reforestation for an important role in his farming activities. Except for one stand of trees (later known as Hemlock Hill)





Maps of land that now comprises the Arnold Arboretum. Benjamin Bussey greatly expanded his holdings between 1810 (above) and 1840 (below).



COURTESY OF MRS. GEORGE SKINNER, ARCHIVES OF THE ARNOLD ARBORETUM

*The mansion on Bussey Hill photographed in the 1930s.*

and a hillside oak that had escaped cutting, the land was treeless, having been cleared to supply the city with firewood, to raise hay, and to graze animals. Shortly after the purchase of the farm Bussey established the first of his woodlots, and by 1810 several areas of young woods were growing. He added numerous species of trees and shrubs to the estate, including European larch, catalpa, honey locust, and silver fir.

Bussey chose to site his mansion on the south side of Weld Hill (now known as Bussey Hill), a commanding location that overlooked the great variety in his landscape: woods, brooks, fields, and meadows. While supervising the farm operations, he watched his new home rise. If he was away, his daughter Eliza and her husband Charles followed the progress of the building. In July of 1816, when Bussey and his wife Judith were enjoying a visit to Saratoga Springs, Eliza sent word that the new house was beginning to look finished, with windows set in the upper stories and the tops of the piazzas shingled.<sup>2</sup> Charles reported a few days later on both farm and house.

[T]he hay of all sorts and the barley are now under cover . . . and the fields are seldom so verdant as the rain Sunday was a constant pour. Joe came very near losing his chickens, many apparently dead after the flood. We brought them into the house and by the application of flannel and by the children's hands all but three were restored to their anxious mothers. The work at the new house proceeds with regularity. About two thirds of the plastering is finished . . . that in the attic and in the entry leading to it has many small cracks in it owing to its drying too fast, occasioned by its proximity to the roof . . . I have cut the dead limbs from the trees in the woods near the walk and the stone wall is finished to the bottom of the summer house. I have also taken the dead wood from the honeysuckles. We have had some days past the company of Miss Ely and her sister from Hartford . . . have taken tea with Aunt Lowder and have had Mr. and Mrs. Parsons with us at dinner yesterday.<sup>3</sup>

The finished mansion was a model of stately neoclassical elegance. It was approached by a gravel carriage road lined with gutters of granite sea pebbles and bordered with white pines

and horsechestnuts. At the top of the steep incline the road ended in a turnaround at the mansion entrance, where granite steps led to a front porch floored with white marble tiles. The interior of the house reflected the popularity of French decor at the time. The dining room wallpaper was of Paris views and monuments. The drawing room and parlor floors were covered with Brussels carpets. Damask draperies hung at the windows and throughout the house were costly French furnishings, such as the settec and set of chairs with needlework upholstery that Bussey had acquired at the close of the French Revolution.

Other accoutrements were added over the years. In 1818 Bussey purchased a copy of the Declaration of Independence for ten dollars, and in 1832, five copies of old masters painted by Rembrandt Peale. Peale sent a note with them expressing his gratitude "that five of his best copies of the masters would reside together in Bussey's hospitable mansion where they would be appreciated properly."<sup>4</sup>

Plantings around the mansion included a wide-spreading American elm, a weeping beech, and a black oak that in time would offer cooling shade. Nearby were cherry and mulberry trees. A few yards from the house, a crescent-shaped pond was fed by an underground reservoir that piped water down to the house. Stone steps and a cobblestone path wound up the hill behind the house, bordered with lilacs and white pines that screened the distant working farm. Myrtle and lilies-of-the-valley covered the ground beneath the trees. At the crest of the hill was the stone-based summerhouse where Bussey and his friends viewed the distant Great Blue Hill and the town of Boston. Looking upward observers could see the heavens, and looking downward on a clear night, the stars were reflected in the crescent pool. The summerhouse later became an observatory.

Friends and neighbors came to Woodland Hill to stroll through the ornamental plantings or to climb the hill to the summerhouse, passing by the sweet-smelling lilacs. Some came for tea, others for dinner. The mansion's spacious rooms and many chairs (the west drawing room alone

held forty-two) allowed the Busseys to entertain large groups. French china, silver pitchers, and crystal goblets made for elegant serving. Much of the food grew on Bussey's land: the cherries came from the orchards, the rhubarb from the garden, and his livestock provided the popular roasted veal and calves-head soup.

His neighbors included Enoch Bartlett of Bartlett pear fame; John Warren, a distinguished physician, known for his Roxbury russet apple; and Joseph Story, associate justice of the United States Supreme Court and a Harvard law professor. One frequent visitor, Dr. Thomas Gray, minister of the Third Parish in Roxbury, often came for dinner following the Sunday worship service. The short distance between the church and Woodland Hill made it very convenient for Gray to visit Bussey as well as for Bussey to attend the meetinghouse.

Relatives and their families also spent many hours at Woodland Hill. They came, mostly from Boston, either by personal coach or by the public stage that had begun hourly service to Roxbury for twelve-and-a-half cents per passage. Eliza and Charles, living at 7 Summer Street, Boston, brought their daughters Judith, Eleanor, Eliza, and Maria to play in the woods and meadows.

Bussey participated in local activities and hosted visiting dignitaries when they came to town. In 1824, when the Revolutionary War hero Lafayette visited Roxbury, he joined the prominent politician H. A. S. Dearborn and Governor William Eustis in paying homage to this well-loved personage. Later, when President Andrew Jackson came to Boston, he joined in another grand procession: Vice President Martin Van Buren rode in Bussey's yellow coach drawn by a team of "six horses, richly caparisoned, and attended by liveried servants."<sup>5</sup>

In his seventies, Bussey placed the farming operations under the direction of his grandson-in-law, Francis Head. Comfortably settled in their mansion, the Busseys enjoyed their Peale paintings along with Gilbert Stuart's portraits of the family, the busts of John Adams, General Henry Jackson, George Washington, and one of Benjamin himself. Outdoor sculptures, Ital-





PHOTOGRAPH BY KENNETH R. ROBERTSON, ARCHIVES OF THE ARNOLD ARBORETUM

*Benjamin Bussey planted this American elm (*Ulmus americana*) in front of his mansion, where it remained for a century and a half, until the mid 1970s, when it became one of the last of its kind in the Arnold Arboretum to succumb to Dutch elm disease.*

ian marble statues and vases, were set along the carriage turnaround and at the mansion's entrance.

The orchards produced acceptable apricots and juicy plums and massard cherries that Bussey said were "for the birds because they took their full share." He added to the beauty of the rhododendrons, tulip trees, and lilacs with trails that wound through the woods, rude

bridges that crossed Bussey Brook, and gold and silver fish that swam in a willow-bordered pond.<sup>6</sup> He continued building a fence of giant ashlar to encompass the entire estate. Some stones were two to three feet in length.

By 1841, when Woodland Hill had reached a pleasing maturity and had grown in size through the purchase of several additional farms, Bussey opened the gates to the public so that others



might share in the beauty of the land. In May of that year, the final codicil of his will was signed. After generously providing for his family, for three good friends, and for the Boston Female Asylum, Bussey set forth a plan to benefit his fellow man through Harvard University.

First, he directed a large portion of his estate to Harvard's schools of law and theology, the two branches of education he considered most important in advancing "the prosperity and happiness of our common country." Second, he provided for a school of agriculture and horticulture. Following the deaths of any heirs and their families, Woodland Hill and his Boston real estate were to be conveyed to the President and Fellows of Harvard College. He ordered the trustees to retain the estate and with the monies and other properties he conveyed to them

to establish "a course of instruction in practical agriculture, ornamental gardening, botany, and other branches of natural science . . . to be called the Bussey Institution . . ." One-half of the income from his estates and property was to be used to support the institution; the other half was for the endowment of professorships or scholarships in the law and divinity schools.

On the evening of January 13, 1842, Benjamin Bussey Esq. died at his seat in Jamaica Plain, aged eighty-five years, a distinguished merchant of Boston, manufacturer of Dedham, benefactor of New England, and master of Woodland Hill.

The deed for the Woodland Hill estate was conveyed to Harvard College by the trustees of the Bussey estate on August 28, 1861. The Bussey Institution's School of Agriculture offered a



*This Gothic Revival building housed the Bussey Institution of Harvard University beginning in 1871, as directed by Bussey's will. It was demolished after a destructive fire in 1971.*



three-year program in farming, horticulture, agricultural chemistry, economic zoology, and entomology. Students were taken into the fields as an introduction to practical farming and later to the Arboretum to study and collect plant specimens. The enrollment was small and decreased even more after land-grant colleges were established. In 1908 the Bussey was reorganized as a research institution with graduate instruction only, and in 1936 its activities were integrated with the biology laboratories of Harvard and the Institution itself was closed.

In the 1870s, just after the Bussey Institution's inception, a portion of Woodland Hill was incorporated by Harvard as part of a new venture, the creation of an arboretum. The nation's first public arboretum was named, not for Bussey but for James Arnold, the New Bedford merchant who donated the funds for its development. Although Bussey's connection to the land was obscured, the Arnold Arboretum offered in great measure what he had desired—education and recreation to untold numbers of citizens who daily walk the grounds and know its beauty. Benjamin Bussey's name lives on through the remaining professorships endowed by his will, through the learning passed on by the hundreds of students of the Bussey Institution, and through the work of Harvard's Biological Laboratories.

#### Endnotes

<sup>1</sup> "The Bussey Institution 1871–1929," William Morton Wheeler, in *The Development of Harvard University Since the Inauguration of President Eliot 1869–1929*, ed. Samuel Eliot Morison (Cambridge: Harvard University Press, 1930), p. 508.

<sup>2</sup> Bussey letter, Jul. 1816, Bussey Papers, Dedham Historical Society.

<sup>3</sup> Letters #46, Aug. 2, 1813, and #45, Aug. 13, 1816, Bussey Collection, William L. Clements Library, University of Michigan, Ann Arbor.

<sup>4</sup> Peale letter to Bussey, Nov. 3, 1832, Special Collections, Getty Center Institution for History of Art and the Humanities, Los Angeles, California.

<sup>5</sup> *Annals and Reminiscences of Jamaica Plain*, Harriet Manning Whitcomb (Cambridge, MA: Riverside Press, 1897), p. 54.

<sup>6</sup> *Ibid.*, p. 53.

<sup>7</sup> Will of Benjamin Bussey, Norfolk County, Massachusetts, Probate Court.

Mary Jane Wilson is a Michigan native with a lifelong interest in Michigan history. Her local and state involvement includes the establishment of the Friends of the Capitol, Inc., and the Docent Guild of the Michigan Historical Center. Her writings include "The Watch of the Capitol," "Lansing, A Look to the Past," and "The Junior League of Lansing 1948–2003."



Remnants of Bussey's outbuildings stood on Bussey Hill into the 1990s.

## THE FOUNDING OF THE TREE MUSEUM IN BUSSEY PARK

Jamaica Plain, Boston, Mass

Commonly Known as The Arnold Arboretum

*From an Address Delivered Before The Garden Club of Alameda County  
June 11, 1922\**

By Mrs. Edward Gilchrist Low

**I**n 1842 Benjamin Bussey died at his country estate, Woodland Hill, leaving most of his property to Harvard College. His town house of Colonial type, with large gardens and stables in Summer Street, in the very centre of the city of Boston, was sold and the proceeds given to Harvard College. His widow was to continue to live at their country estate, Woodland Hill, Jamaica Plain. In 1849 the widow died. Then a grand-daughter came into possession, having life tenure of the place. Eventually the greater part of the property was to be used for a School or College, where agriculture, botany and all scientific studies pertaining thereto should be established at Woodland Hill.

This place had upon it a Mansion House, four cottages, stables, farm, barns and outbuildings. There were 360 acres. In 1815 the place had been laid out by an architect, who evidently had great artistic taste. To approach the house from the street there was a fine avenue, fairly steep in ascent, bordered on either side by white pines and horse chestnuts, and on the west side of these were cherry and mulberry trees.

The view from the Mansion House was very pleasing. To the south on the horizon line stretched the Blue Hills in Milton; in the immediate foreground was an oval of grass, decorated with marble statues and marble vases on which were carved masks; these came from Italy. Behind the house there were stone steps leading to a path winding round a hill for three quarters of a mile; it was bordered by trees—pines, beeches, wild cherry, *Cercis canadensis*, yellow laburnum, syringas and lilacs, and under these were many flowering plants—lilies-of-the-valley, periwinkle, *Lilium flavum* and others.

On the summit of the hill was an octagonal room called the Observatory, for the extended view which spread out before one's eyes—to the south the Blue Hills, the Hemlock Hill, the undulating country, pasture land, and to the east the State House and Boston Harbor. Near the house were herbaceous borders interspersed with shrubs—*Magnolia*, *Umbrella tripetala*, weeping cherry, a fine tulip tree, *Liriodendron tulipifera*, *Narcissus poeticus*, tulips, crocuses, Stars of Bethlehem, Cinnamon roses, etc.

There were vegetable and fruit gardens and a cold glass house, where large plants oleanders and other kinds, used to decorate the piazza, were wintered. The woods





*"Bussey's Woods," now known as Hemlock Hill, became a favorite site for recreation among nineteenth-century Bostonians. Century Magazine published this view in 1892.*

were filled with wild flowers. There were picturesque stone bridges with round arches, under which the brook babbled. This was fed by a living spring, whose fresh water ran through a fish pond, where gold fish swam about, then by a narrow marble trough, down a small bank; soon it leaped over rocks and stones until, checked in its swift course by the meadowland, it meandered slowly to join the larger streams far away. There was a legend that the Indians in the early part of the eighteenth century came from afar to drink of this water, and it was always called The Indian Spring.

There were pleasure grounds, fish ponds, orchards and the wondrous Hemlock Hill, designated by Sir Joseph Hooker of Kew Gardens, England, the finest in the world.

This is a description of Woodland Hill, now known in the archives at the City Hall, Boston, as Bussey Park, in 1842, at the time of Benjamin Bussey's death.

\* The typescript in its entirety is in the Archives of the Arnold Arboretum. In 1901 Mrs. Low, a great-granddaughter of Benjamin and Judith Bussey, established on her land in Groton, Massachusetts, "a college where instruction [was] given to women in Landscape Gardening, Elementary Architecture, Horticulture, Botany and allied subjects."

# A Century of Breeding Bird Data—Changes Over Time at the Arnold Arboretum

Robert G. Mayer

The area that is now home to the Arnold Arboretum attracted resident and migrating birds long before it was officially established in 1872. Birds beget birders, who in turn keep records of the species that visit and nest in a given location. By 1895, when the first known report of breeding populations was compiled, the Arboretum encompassed all but fifteen of its current 265 acres. While the landscape has not changed much over the intervening century, the living collections—now comprising over 4,500 woody plant taxa—have changed dramatically. Habitats within the Arboretum's boundaries include marshland, deciduous woods, coniferous areas, streams, and three manmade ponds surrounded by lawns, providing hospitable sites for many diverse species of birds to raise their young. Lists drawn up by regular birders show that while the number of nesting species at the Arboretum has remained quite stable since 1895, many changes have occurred in the lists' components. In this article I review those changes and speculate on their causes, as well as on prospects for the future.

## The Listers

In 1895, *Garden and Forest* published a short article in which Charles E. Faxon documented his bird sightings in the Arboretum over a period of several years.<sup>1</sup> According to the article, fifty species of birds were then nesting in the Arboretum. Sixteen years later, Faxon added another five species to the list.<sup>2</sup>

For the better part of his career at the Arnold Arboretum (1882–1918), Faxon was in charge of the library and herbarium, but it is as a botanical illustrator that he has been remembered. His publication list approaches two thousand drawings. In a review of Charles S. Sargent's *Silva of North America*, where many of these



Yellow warbler sitting on nest in a mockorange on Bussey Hill Road.

drawings were published, naturalist John Muir declared him "the foremost botanical artist in America."<sup>3</sup>

Like that of many other scientists of his era, Faxon's interest in natural science was broad; he was an enthusiastic birder as well as a botanist. Recognizing the importance of the Arboretum as a birding site, he set about to "put on record a statement of the present bird population of the place" so that future observers "[could] see how many of the present feathered tenants will remain."<sup>4</sup> Faxon is memorialized at the Arboretum by the name of one of the three manmade ponds near the Bradley Collection of Rosaceous Plants.

Miriam E. Dickey, for many years head of the education department of the Boston Children's Museum, led bird walks in the Arboretum



nearly every Saturday for 35 years, from 1939 through 1976. In 1976 she reported in an article for *Bird Observer of New England*<sup>5</sup> that she and her group of regular birders had seen nearly 150 species of birds at the Arboretum, of which 45 "[had] been seen on a nest with eggs or young." Many of the observers were children from the summer day camp that Dickey ran for nearly thirty summers. Her efforts to educate children about natural science also included teaching in the Boston Public Schools and in a Massachusetts Audubon Society program for inner-city children. She remained active in both birding and teaching until her retirement in 1997 at the age of ninety and in 1998 was inducted into the Massachusetts Hall of Fame for Science Educators.

In 1971 *Arnoldia* published a report about birds nesting at the Arboretum written by Richard E. Weaver. Weaver, who played a key role in shaping the Arboretum's grounds during his thirteen-year tenure as horticultural taxonomist and assistant curator,<sup>6</sup> included in his article not only his own observations but a list drawn from Faxon's and Dickey's observations as well. His list totals 44 species.<sup>7</sup>

And finally, the last report in this overview was compiled by the writer. I have been birding at the Arnold Arboretum almost weekly for nearly five years. With the contributions of several other experienced birders, I have documented forty-six confirmed breeders and another five probable breeders during that period.<sup>8</sup> The combined list from these four reports is presented in the table that appears on page 14.

### The Losses

As the list shows, the number of breeding species at the Arboretum has decreased somewhat over the century. Twenty-seven species that were recorded by previous observers are most likely no longer nesting on the property. Two game birds, bobwhite and ruffed grouse, may have been extirpated early on by hunting or by habitat

loss; another, ring-necked pheasant, was last seen in 2000. The spotted sandpiper, black- and yellow-billed cuckoos, least flycatcher, barn swallow, and eastern bluebird have not nested there since the middle of the twentieth century, probably owing to the loss of suitable habitat and nesting sites and to a reduction in the overall population of some of these species. Seven warbler species, as well as yellow-throated vireo and veery, have stopped nesting in the Arboretum. Some of these species have experienced significant population decreases throughout Massachusetts, while others may no longer be able to find hospitable nesting sites in the increasingly urban habitat. Ground nesting species, such as bobolink and field sparrow, have lost habitat since the Arboretum staff began cutting the grass shorter at the beginning of the twentieth century; increasing numbers of dogs and walkers in the meadows may also have discouraged nesting. That bobolinks have recently begun breeding again on Peters Hill, discussed below, indicates that these trends can be reversed.

### The Gains

On the positive side, seven species that did not appear on previous lists have been documented as confirmed or probable breeders at



*Yellow warbler nestlings surrounded by mockorange.*



## List of Breeding Birds by Reporter

Species	Faxon	Dickey	Weaver	Mayer	Species	Faxon	Dickey	Weaver	Mayer
Green Heron				X	Cedar Waxwing	X	X		
Mallard		X	X	X	European Starling		X	X	X
American Black Duck		X	X		Yellow-throated Vireo	X			
Wood Duck		X			Warbling Vireo	X	X	X	X
Cooper's Hawk				X	Red-eyed Vireo	X	X	X	X
Red-tailed Hawk			X*	X	Blue-winged Warbler				X
American Kestrel			X*		Golden-winged Warbler	X			
Ring-necked Pheasant	X	X	X		Brewster's Warbler	X			
Ruffed Grouse	X				Yellow Warbler	X	X	X	X
Northern Bobwhite	X				Chestnut-sided Warbler	X			
Spotted Sandpiper	X				Black-throated Green Warbler	X	X		X*
Rock Pigeon		X	X	X	Pine Warbler				X*
Mourning Dove		X	X	X	Prairie Warbler	X	X		
Yellow-billed Cuckoo	X				Black-and-white Warbler	X			
Black-billed Cuckoo	X				American Redstart	X			
Eastern Screech-Owl	X	X		X	Ovenbird	X	X	X	X*
Great Horned Owl			X*	X	Common Yellowthroat	X	X	X	X
Chimney Swift	X	X	X	X*	Yellow-breasted Chat	X			
Ruby-throated Hummingbird	X				Scarlet Tanager	X	X	X	
Downy Woodpecker	X	X	X	X	Northern Cardinal		X	X	X
Northern Flicker	X	X	X	X	Rose-breasted Grosbeak	X	X	X*	X*
Eastern Wood-Pewee	X			X*	Indigo Bunting	X	X	X	X
Least Flycatcher	X				Rufous-sided Towhee	X	X	X	X
Eastern Phoebe	X	X	X	X	Chipping Sparrow	X	X	X	X
Great Crested Flycatcher		X	X*	X	Field Sparrow	X			
Eastern Kingbird	X	X	X	X	Vesper Sparrow	X			
Barn Swallow	X				Song Sparrow	X	X	X	X
Blue Jay	X	X	X	X	Bobolink	X			X
American Crow	X	X	X	X	Red-winged Blackbird	X	X	X	X
Black-capped Chickadee	X	X	X	X	Common Grackle		X	X	X
Tufted Titmouse				X	Brown-headed Cowbird	X	X	X	X
White-breasted Nuthatch		X	X	X	Orchard Oriole				X
Carolina Wren	X			X	Baltimore Oriole	X	X	X	X
House Wren		X	X*	X	Purple Finch	X		X	
Eastern Bluebird	X				House Finch				X
Veery	X				American Goldfinch	X	X	X	X
Wood Thrush	X	X	X	X	House Sparrow		X	X	X
American Robin	X	X	X	X					
Gray Catbird	X	X	X	X		55	45	44	51
Northern Mockingbird		X	X	X					
Brown Thrasher	X	X	X	X	* = probable breeder				

the Arboretum in recent years. Nesting green herons have been seen several times near the ponds, most recently in 2003. A pair of Cooper's hawks was seen together in the Hemlock Hill area throughout the summer of 2004, and later with a juvenile. Some birders speculate that the woolly adelgid infestation may have indirectly encouraged the hawks to breed at the Arboretum by decreasing the density of the hemlock stand; the species' overall population increase in Massachusetts may also account for this new record. Tufted titmouse, another recent addition to the list, has become a common nester in the state as it extends its range northward.

In 2003 a pair of blue-winged warblers nested in a shrub in the Bradley Garden, but we don't know whether their young fledged and they have not been found nesting again. Pine warbler has shown a trend toward nesting in both coastal and interior areas of Massachusetts; in the Arboretum they are probable nesters in the conifer collection as well as in the pines on Peters Hill. An orchard oriole nest was discovered in June 2004 in a *stewartia* next to the wet meadow near the main entrance. The same pair of birds, or another pair, returned in 2005 to nest in a *katsura* less than 15 feet away. Orchard orioles had been sighted in late May several years earlier, suggesting that nesting may have occurred even before 2004. Finally, house finches have replaced purple finches as nesters in the Bradley Collection, as they have throughout much of the eastern United States.

Other species now missing although present on previous lists may simply have been overlooked in the surveys of the last five years. In this category are cedar waxwing and scarlet tanager, both of them likely species for breeding in the Arboretum. Red-bellied woodpecker, known to nest in nearby Franklin Park, and willow flycatcher, which is heard increasingly late into the spring, especially in the new Stony Brook Marsh section of the Arboretum, are both good candidates for turning up in surveys within the next decade.

### An Exciting Case History: Bobolinks

In late May of 2005, a flock of forty or more migrant bobolinks was seen on the grassy slopes of Peters Hill, considerably more than usual

for that area. Hoping to encourage the birds to nest, the Arboretum staff stopped mowing in that area and posted signs urging dog walkers to avoid the tall grass and keep their dogs leashed. The effort was rewarded: by mid June at least one pair of bobolinks had nested near the top of the hill. The pair was later observed bringing food to hatchlings and there was evidence that young birds had crawled out of the nest, but no confirmed sightings of fledglings were reported, perhaps because the intense heat wave in late June led to the hatchlings' demise. Nonetheless there is hope that continued protection and delayed mowing will attract more nesters next year and that bobolink breeding will be firmly reestablished in the Arboretum after more than a century.

### Endnotes

- <sup>1</sup> C. E. Faxon, "Birds of the Arnold Arboretum," *Garden and Forest* (July 1895) 8(387): 292-93.
- <sup>2</sup> — — — "Birds in the Arboretum," *A Guide to the Arnold Arboretum*, 1911: 31-33.
- <sup>3</sup> John Muir, "Sargent's Silva," *Atlantic Monthly*, July 1903.
- <sup>4</sup> Faxon, "Birds of the Arnold Arboretum."
- <sup>5</sup> Miriam E. Dickey, "The Arnold Arboretum as a Birding Area," *Bird Observer of Eastern Massachusetts* (Jan-Feb 1976) 4(1): 4-7.
- <sup>6</sup> R. E. Weaver, "Birds in the Arnold Arboretum," *Arnoldia* (Nov 1971) 31(6): 349-365.
- <sup>7</sup> Papers of Richard E. Weaver, Jr., 1970-1983, Archives of the Arnold Arboretum, Jamaica Plain.
- <sup>8</sup> Using the definition of "probable" applied in the *Massachusetts Breeding Bird Atlas*, which includes (1) singing male present or mating calls heard on more than one date in same place; (2) a bird or pair of birds apparently holding territory or visiting probable nest site; (3) courtship and display or aggressive behavior or anxiety calls from adults, suggesting probable presence of nest or young nearby; (4) nest building by some wren and woodpecker males, birds known to build multiple nests in a flurry of eager optimism, which is sometimes entirely unwarranted.

Robert Mayer has been birding, photographing, and volunteering as a docent and field study guide for five years at the Arnold Arboretum.



# The (un)Natural and Cultural History of Korean Goldenrain Tree

Michael S. Dosmann, Thomas H. Whitlow, and Kang Ho-Duck

The midsummer floral and autumnal fruit displays of goldenrain tree, *Koelreuteria paniculata*, have caught the eye of Western botanists and gardeners alike since 1747, when Pierre d'Incarville, a Jesuit priest, introduced the species to Europe from northern China. By 1763, this charming tree was being grown in the Jardin du Roi in Paris, and in 1809 it made its first known appearance in the United States when Thomas Jefferson received a shipment of seeds from Madame de

Tessé, a French aristocrat and fellow botany lover with whom he often traded plants. It has since become a popular garden ornamental and is much appreciated for its tolerance of urban conditions.

Goldenrain tree's Chinese distribution lies in the eastern half of temperate China, extending from Sichuan Province northeast to Liaoning Province, where it is frequently found growing in dry streambeds and valleys. About a dozen separate populations have been discovered on

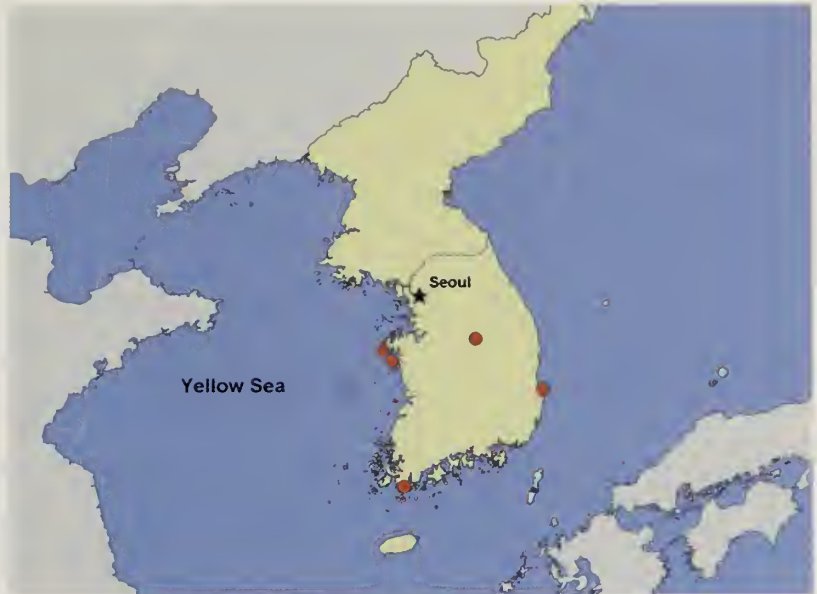
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Goldenrain trees in bloom above their namesake restaurant—Mogamchoonamu—in Balsan 1-Ri, a fishing village near Pohang on the eastern coast of the Korean peninsula.

the Korean peninsula as well as in Honshu, Japan. Several theories about the origin of these populations have been proposed. The close proximity of most populations to the Yellow Sea suggests a likely route for Chinese propagules dispersed by water, man, or some combination of the two. In his 1976 monograph of the genus, Frederick Meyer of the U.S. National Arboretum states convincingly that the species' appearance outside of China was due solely to man.<sup>1</sup> The species was not encountered during Japanese botanist Takenoshin Nakai's thorough survey of the Korean peninsula (1915–1936).<sup>2</sup> However, we cannot assume they were not present at the time, as the small, isolated populations could easily have been overlooked. Contrary to the view that the species was introduced from China, the recent discovery of several inland populations has led to speculation by some that it was once naturally widespread throughout the Korean peninsula and that only a few remnant populations remain.<sup>3</sup>

The cultural significance of goldenrain tree in Asia lends support to the argument for human-mediated origins. Chow noted that in China it was common around temples, palaces, and gardens and was used to mark the tombs of important officials.<sup>4</sup> Likewise in Japan, the use of goldenrain tree is linked to religious practices. An early researcher posited that it may have first appeared in a Buddhist monastery in Kyoto around 1220 AD, grown from seeds brought from China.<sup>5</sup> Ohwi, a prominent Japanese botanist of the twentieth century, also believed in the Buddhist connection, pointing out that the species had naturalized near temples along the shoreline.<sup>6</sup> (Buddhism arrived in Japan in the mid sixth century, most likely by way of Korea, where it can be traced back to the mid-to-late fourth century.) In Korea, the species has been preserved in local forests by villagers for use in shelterbelt plantings to protect homesteads from salt spray.<sup>7</sup>



Red dots mark the five *Koelreuteria paniculata* populations the authors visited in South Korea. Locations, counterclockwise from top left: Anheung, Anmyondo, Wando, Pohang, and Woraksan.

Their origin is not the only aspect of the Japanese and Korean populations that has puzzled botanists. Their ability to survive the stressful conditions at the ocean's edge has also been of interest. In 1979 the Morris Arboretum's Paul Meyer collected from trees in Paengnipo (also known as Panjikol) on the west coast of South Korea. He described the population as "a dense scrubby thicket with few plants reaching more than two meters, the plants growing on sand dunes, just above the high tide level."<sup>8</sup> He depicted the site as "exposed to periods of sea water inundation, wind, drought and salt spray." Their unusual character also prompted collection by Arnold Arboretum botanists Richard Weaver and Stephen Spongberg in 1977.<sup>9</sup>

Recent studies of Korean populations, most of which now have government protection because of their biological and cultural significance, have found high genetic differences among populations but low levels of genetic diversity within them, suggesting local inbreeding and little gene flow between populations.<sup>10</sup> To date, however, the comprehensive phylogenetic study that would be required to establish the relationships of all the Korean populations—as well as those of China and Japan—has not been undertaken.





*The first sighting of goldenrain trees was outside several marina buildings on the island of Anheung.*

The Urban Horticulture Institute (UHI) at Cornell University has been studying the goldenrain tree for several years, in particular because of its tolerance of the stresses of urban landscapes. The UHI staff has assembled a diverse germplasm repository of living plants from Asia as well as from Western gardens, and has been conducting experiments in the field, greenhouse, and laboratory to better understand the species' natural variation and its physiological response to varying environments. Asia's coastal populations have been targeted to test hypotheses related to microevolution and adaptation to salt spray. However, results of *ex situ* experiments, no matter how compelling, are best viewed in light of the plant's natural habitat. Therefore, during the summer of 2004 the three authors visited five populations of

goldenrain tree in South Korea, one inland and four along the coast. In addition to describing the sites and the condition of the trees, we collected tissue for future molecular analyses, measured photosynthesis to assess plant performance using a portable gas-exchange system (LiCor 6400), and, when possible, interviewed local people.

### **Anheung**

Michael and Tom arrived in South Korea on the evening of June 14, 2004, and met Kang the following morning. During the ninety-minute drive to Seoul, we discussed woody plants of mutual interest—in particular, mogamchoonamu (the goldenrain tree). Once at Dongguk University, we toured Kang's laboratory, readied our expedition supplies, and met his graduate



students, including Kim Tae-Young, who joined us on our trip.

The next morning, we left for the province of Chungcheong Namdo, west-southwest of Seoul. In the small town of Mollipo<sup>11</sup> we joined Chang Kyon-Wan, chief of the western branch of the Korea Forest Research Institute (KFRI). We had intended to visit the nearby population at Paengnipo but learned that it had recently been destroyed for resort construction. (Government protection is at times more theoretical than real.) Mr. Chang recommended that we instead visit another population in the region, near the island fishing village of Anheung. None of us had heard of this population, but we eagerly hopped in our car and headed south, following Mr. Chang to our destination. Upon arrival, our guide provided us with a general lay of the land, told us where to find our target species, and then had to depart. A view with binoculars of a distant wooded hill revealed trees with pinnately compound leaves. But after rushing over we identified it as *Platycarya strobilacea*, of the walnut family, a common species in the region. This was only after discovering its strobiles, peculiar dried, five-centimeter (cm)-long, cone-like fruits. We also saw a great deal of *Pinus densiflora* (Japanese red pine) and of shrubs such as *Rhus chinensis* (Chinese sumac) and an Asian species of spicebush, *Lindera obtusiloba*—but no goldenrain trees.

A bit disgruntled, we made our way along a bumpy dirt road to the very tip of the island where we had our first sighting: two multistemmed trees growing among fishnets, traps, and a rubbish heap outside a boat rental business. They stood 4 to 5 meters (m) tall and had a dense canopy of conspicuously cupped leaves, a response to salt-spray stress. With rising spirits we followed the road a kilometer (km) up and over a final hill, past a copse of *Pinus densiflora* to the ocean's edge, where we found the actual population. We had no trouble identifying the species, for not only were the trees protected by a chainlink fence 1.5 m high, but little yellow signs labeled "*Koelreuteria paniculata*" hung from nearly every tree. Such is the nature of plant exploration in the twenty-first century.

Despite being protected, the population had not been mentioned in any previous reports,

so it was important that we census the site in the few hours remaining before dusk. The trees were growing 8 to 10 m from the harbor's edge, covering about half a hectare (ha). Goldenrain tree was the dominant species, with a few small *Platycarya strobilacea*, *Rhus chinensis*, *Elaeagnus macrophylla*, harlequin glorybower (*Clerodendrum trichotomum*), and the viney *Hedera rhombea* mixed in. We counted 25 adult goldenrain trees ranging from 3 to 4 m in height but no juveniles despite evidence of fruiting the previous year. There were both single- and multistemmed trees; most were growing upright although on the stand's windward edge we found a few prostrate individuals. To describe the trees as vigorous would be an overstatement: There was widespread evidence of salt injury on the leaves, including leaf-rolling (cupping) and surface puckering. Over time, leaves exposed to salt can become chlorotic (yellowed) or even die, and we saw both. We also found misshapen branches that had shortened internodes (spaces between leaves), resulting in leaves growing abnormally close together. This, when accompanied by a windswept form, is the syndrome referred to as elfinwood, which is akin to the krumholz commonly seen in conifers at high altitudes.

At this site as elsewhere, we recorded height and stem diameter and attempted to estimate the age of the trees through increment coring. The largest diameter at breast height (dbh) was 34.5 cm and we ascertained that this stem was 72 years old. Quite a few of the multistemmed trees were noticeably larger at the base; coring one tree's base and largest stem yielded 84 and 38 annual rings, respectively. Most of the trees were similar in size and habit, suggesting an even-aged stand that may have had most of its stems cleared several decades ago. The substrate, unexpectedly, consisted mainly of cobblestones, perhaps ship bilge or dredge spoil from the nearby harbor.

The next morning we made our way to the nearby Chollipo Arboretum. This famous plant collection, situated among the coves at the ocean's edge, was founded by the late Carl Ferris Miller in the early 1970s and is at the top of the must-see list for any connoisseur of woody plants.<sup>12</sup> Chong Mun-Yong, the hor-

gricultural director, gave us a warm welcome and a complete tour, despite the torrential rain that marked the beginning of the monsoon season. The collections of magnolias and hollies were impressive, and the heady aroma from the blooming chinaberry (*Melia azederach*) was nearly overpowering. We also saw a number of goldenrain trees that had been collected from the now extirpated Paengnipo site; had it not been for Mr. Miller's efforts, it is doubtful that germplasm from this population would still exist. At the end of our visit, when Mr. Chong invited us to sign the institution's visitors' book, Michael and Tom laughed at how small the botanical world was—just two days before, the Arnold Arboretum's Peter Del Tredici had signed the book during his visit.

### Anmyondo

Our next destination was a site near the seaside resorts of Bangpo Beach and Bangpo Harbor, on the western edge of Anmyondo, an island in the Yellow Sea to the south of the Taean Peninsula. After arriving on the afternoon of June 16 and dropping our things at the hotel, we decided to explore the area while there was still daylight. To aid in our search for the goldenrain trees, we had brought photographs taken by Paul Meyer during his 1984 visit. They showed a remote population of several hundred wind-swept trees at the ocean's edge, with a steep hill in the background.

Not five minutes after we set off on foot along the high-tide line from Bangpo Beach south toward Bangpo Harbor, we were surprised to stumble upon a cluster of scrubby *Koeleria paniculata* scattered across the base of a hill—but it was clearly not the population shown in Meyer's photos. This group consisted of about 20 small trees, all less than 2 m tall. Leaf injury from salt spray was more severe than at Anheung, but it was largely confined to the outermost leaves, and a recent second flush had produced substantial new growth. We found a motley assortment of other species growing here, including the vines *Pueraria lobata* (kudzu, the "vine that ate the South"), *Lonicera japonica* (Japanese honeysuckle), and shrubs such as *Ligustrum obtusifolium* (border privet), *Eleagnus macrophylla*, and a shrubby

member of the linden family, *Grewia biloba* var. *parviflora*. While all showed some salt damage, their growth seemed only marginally compromised. The most common symptom among these species, in addition to leaf yellowing, was succulence: many leaves become thicker when exposed to salt spray. (The *Grewia* were particularly resilient.) The substrate along the tidal marks was the same as at Anheung: large cobblestones. These stones had clearly washed ashore from the ocean, prompting us to reconsider our earlier hypothesis that the Anheung population was growing on dredge spoil or ballast rather than on naturally deposited stones.

Farther down the beach, we got our first view of Bangpo Harbor and our original target population. The site looked very different from the 1984 photos. The beach and high-tide mark, just a few meters from the population's edge in 1984, were now 75 to 100 meters away. Between the trees and the sea, parking lots, boardwalks, hotels, and restaurants had been built to accommodate the flourishing tourist and fishing industries. The goldenrain trees, covering nearly a hectare (1.47 acres), were surrounded by a formidable 1.5-m-tall wrought-iron fence painted grass green. Two large interpretive signs, in both Korean and English, described the species and the population's designation in 1962 as a monument (number 138). We laughed at our achievement in finding such an isolated population; a glowing neon sign would not have made it more obvious.

Unlike the Anheung population, this one was actively managed by local authorities. All understory vegetation had been removed and many of the trees were propped up with metal braces and cables to force upright growth. All of this had been done since 1984, when few trees were taller than 3 m; they now generally ranged between 5 and 7 m in height. Their growth and increased vigor probably resulted from the decline of salt spray over the past two decades: a breakwater now lessens the intensity of wave action, the waves themselves are farther away, and in some parts of the site, buildings now block spray completely.

We were assisted over the next few days by Kang's colleague Woo Su-Young, a professor in the Department of Environmental Horticul-





*The western edge of the Bangpo Harbor goldenrain tree population on Anmyondo as it appeared in 1984, above, and in 2004, below.*



ture, University of Seoul. We had intended to measure foliar salt deposition, but recent rains had washed all the salt from the leaves. However, especially on the farthest windward canopy edges, leaf damage from earlier exposure was substantial, mostly limited to cupping/rolling and puckered (bullate) surfaces, which allowed us to assess the stress. Some leaves had been killed, but in many of these cases new growth was emerging from buds lower on the branch. We also found that looks can be deceiving, as gas-exchange measurements on mature leaves—even those with significant injury—had moderate to high photosynthetic rates.

Stem size was fairly uniform throughout, though the trees on the farthest windward edge were smaller. The stand's basal area, which is an estimate of the total cross-sectional area of all trees in the stand (here only goldenrain tree), was 14.2 m<sup>2</sup>/ha. While we do not know what the basal area had been in previous years, we could compare dbh values. Mean dbh was nearly twice that reported by Lee *et al.* in 1997, supporting our view that the trees had grown significantly as the amount of salt spray had declined recently. Most of the trees had multiple stems that separated 20 to 30 cm above the base, and the mean basal diameter was 21.8

cm. We tried to age individuals by coring stems and bases but found internal rot in most trees beyond 25 to 30 annual rings. Despite finding copious seeds from the previous year, we found no evidence of seedling recruitment, which could be the result of poor germination and/or the removal of juveniles during clearing. This failure of seedlings to regenerate, particularly if over a prolonged period of time, constrains a population's ability to survive.

Despite this lack of sexual reproduction, we found conclusive evidence of clonal regeneration. One rainy afternoon, as we cored the base of a multistemmed tree, we removed a bit of soil from around the base and saw what appeared to be a horizontal stem leading away from it. With trowels, penknives, and fingers, we carefully excavated the sandy loam from the stem and at its end, 1.2 m away from the trunk, we found another, slightly smaller tree. Curious to explore the network further, we excavated the opposite side of the original tree and found another lateral stem, this one leading to a prostrate individual. Two other trees within 2 m of the original stem also turned out to be vegetative clones. In response to disturbance and other stressors, many temperate trees form basal sprouts.<sup>13</sup> To our knowledge, this

is the first documented observation of stem or root suckering in *Koelreuteria paniculata*. In light of the stand's poor sexual reproduction, clonal reproduction would seem to play a critical role in its persistence and might also explain the low levels of within-population genetic diversity reported in earlier studies of coastal populations.

Soil cores taken near the central stem showed a marked difference between the windward and leeward sides of the clump. The leeward side was topped by an organic layer at least 6 to 8 cm thick, whereas the windward side had a very shallow organic layer, typically of less than 2 cm. This kind of soil profile is similar to that of dune-forming



At the population on Anmyondo, we discovered that goldenrain tree can vegetatively reproduce from stem and root suckers.

species whose networks of roots and stems capture organic matter, often their own fallen leaves. Nearer the ocean's edge of the stand, we found that soil had lower organic matter and was coarser, in many cases comprising stones similar to those we had observed at other sites.

We had wonderful meals at the Marine Motel, just a stone's throw from the goldenrain tree population. One evening, after sampling a fruity North Korean alcohol made from bilberry (*Vaccinium uliginosum*), we interviewed the proprietress, Mrs. Choi. Her family had lived at Bangpo Harbor for many generations, and she considered herself the trees' caretaker, much to the chagrin of the local authorities. She told us that the population had been there for as long as her family could recall, at least 150 years. When her grandfather was a boy, it had been much larger and was managed by the family as a windbreak to protect the homestead and garden from salt spray. She was quick to point out that it was not until the population was designated a cultural landmark in the 1960s that it shrank in size and became a monoculture. We asked about the goldenrain trees' origin, but she had no answer beyond the traditional local explanation—that the trees came from China—and had no idea of whether they had been deliberately planted or had grown from seed that floated across the sea.

### Wando

The island of Wando is positioned off the south-southwest edge of the Korean peninsula and is home to an array of warm-temperate woody species such as *Camellia japonica*, *Actinodaphne lancifolia*, an evergreen member of the laurel family, and *Cinnamomum japonicum*, sometimes called the Japanese camphor tree. On the morning of June 21 we met Oh Chan-Jin of the Wando Arboretum, which has been coordinating goldenrain tree preservation efforts at a site



A large flowering goldenrain tree growing near the fishing hamlet of Kalmun-ri, Wando. During our visit, only about half of the population had been protected by a fence; the remaining areas were used by local fisherman to store floats and nets.

near Kalmun-ri. He described the population there as the healthiest he had seen in Korea, attributing the trees' vigor to the microclimate of the site: it is on the island's northwest side, separated from the mainland by only 2.5 km and therefore protected from harsh winds off the ocean. The population came under government protection as recently as 2002 (monument number 428), and at the time of our visit only half of the area had been fenced in.

After our chat with Mr. Oh, we drove the short distance to the hamlet of Kalmun-ri, where the woods spanned several hectares along nearly a kilometer of shoreline, with most of the *Koelreuteria* in a strip running about half that distance. At the high-tide mark, a 1.5-m-high stone retaining wall had been erected along much of the site's length. Jutting from the wall was a 50-m quay, to which several boats were moored and where local fishermen unloaded their daily catches.

There was much greater species diversity here than at the previous sites, which were essentially monocultures. Bigleaf dogwoods (*Cornus macrophylla*) were in full bloom, the largest any of us had seen (several over 50 cm in dbh and



## Summary of Populations Visited and Primary Sampling Data

Location and description	Latitude (N)	Longitude (E)	Number of individuals	Average dbh (cm)	Largest dbh (cm)	Oldest stem	Average height (m)
Anheung, protected population near harbor	36° 40.922'	126° 07.190'	25	12.8	34.5	86	3.5
Anmyondo, small feral population near Bangpo Beach	36° 30.423'	126° 20.0'	15 to 20	—	—	—	1.5
Anmyondo, protected population at Bangpo Harbor	36° 30.275'	126° 20.124'	ca. 375	12.4	20.6	36 <sup>a</sup> 6	
Wando, protected population at Kalmun-ri	34° 21.864'	126° 38.507'	ca. 800	18.7	46.7	53 <sup>a</sup> 8	
Pohang, westernmost edge of population near Mason-Ri	36° 0.824'	129° 28.723'	— <sup>b</sup>	11.5	18.4	29 <sup>a</sup> 6	
Pohang, site near Balsan 1-Ri	36° 1.614'	129° 30.157'	— <sup>b</sup>	19.6	32.4	45 <sup>a</sup>	10
Pohang, easternmost edge of population near Tae Bo 1-Ri	36° 4.543'	129° 32.721'	— <sup>b</sup>	8.6	14.6	—	2.5
Worakson, population near Podogam hermitage	36° 54.026'	128° 5.405'	36	13.2	24.3	27 <sup>a</sup>	8.5
Worakson, population on Joonbong Valley Ridge	36° 53.431'	128° 5.316'	20 to 25 <sup>c</sup>	11.8	12.8	21	5
Worakson, population in Joonbong Valley	36° 53.360'	128° 5.314'	300<	20.3	35.5	—	8.5

<sup>a</sup> rotting of internal core limited age estimation  
<sup>b</sup> continuous population comprising 1000s of trees  
<sup>c</sup> mostly juveniles

10 m tall), their scaly, alligator-like bark and canopies of creamy white flowers prominent everywhere. *Acer pseudosieboldianum* (Korean maple) were also very large, one measuring 44 cm in diameter. Also present in large numbers were Korean plum yew (*Cephalotaxus koreana*), Chinese quince (*Pseudocydonia sinensis*), and Chinese hackberry (*Celtis sinensis*). The multi-stemmed Korean hornbeam (*Carpinus coreana* var. *major*) were particularly striking with their glossy, fluted, muscular bark frequently covered with moss and lichen. (This species has significant ornamental potential but is rarely seen in cultivation.) The understory in these woods was also rich, with an assortment of species including *Cinnamomum japonicum*, *Eleaegnus macrophylla*, *Grewia biloba* var. *parviflora*, and juveniles of *Cudrania tricuspidata*, a relative of the North American osage orange.

We concentrated most of our sampling efforts in a part of the fenced section that had not been cleared or otherwise recently disturbed. Mean basal area values for two parallel transects, 5 and 20 m from the beach, were 28.7 and 21.8 m<sup>2</sup>/ha, respectively. These values, when compared to those from the Anmyondo site, illustrate the greater volume in the Wando stand. The dominance of *Koelreuteria* in the shoreline transect was easily apparent: this species' mean basal area was 15.5 m<sup>2</sup>/ha at the edge and 1.7 m<sup>2</sup>/ha deeper into the stand. Compared to other tree species present, goldenrain tree was the greatest in relative density (42 percent) and frequency (27 percent). Overall, the goldenrain trees here were larger than those at previous sites, some exceeding 10 m in height. Once again, we saw evidence of clonal regeneration, but we also found considerable seedling regeneration. As

at the other sites, recent rains prevented us from quantifying salt deposition on leaves, but even on robust trees we found clear evidence of salt-spray injury, mostly cupping with a minor amount of necrosis and defoliation. As might be expected, the damage was most evident where exposure was greatest, on the outer edge of the canopy and on trees nearest the ocean. Surprisingly, even the injured leaves showed moderate-to-high photosynthetic rates.

An interpretive sign near the entrance to the site described in both Korean and English the special nature of *Koelreuteria paniculata*, noting that their seeds had once been used to make rosaries. Our queries of local residents produced answers similar to those of Mrs. Choi in Anmyondo: the stand had been there for generations, likely planted as a windbreak centuries ago.

### Pohang

On June 23, we left Wando driving east along the peninsula's southern coast, then north to the industrial city of Pohang, on the east coast. It was just beyond the city, at the edge of Yongil Bay and facing the open ocean, that we found the next population. We knew very little about this site and no local authorities were scheduled to meet and guide us. Instead, we relied on a set of GPS coordinates. After a few wrong turns we found ourselves on a narrow, twisting road that wound through small fishing villages along the rocky coastline. About 3 km from our target coordinates, we saw the first *Koelreuteria*, in dramatic full flower. The trees dotted the landscape for a stretch of about 10 km, between the village of Mason-Ri eastward to Tae Bo 1-Ri. In some areas, steep hillsides were blanketed with large, healthy trees in full



From left, Kim-Tae Young, Ho-Duck Kang, and Michael Dosmann conduct a vegetation survey on Wando. Kang is measuring the diameter at breast height of a *Cornus macrophylla*.





*Goldenrain trees in full flower growing above the ocean near Mason-Ri, outside Pohang on the east coast of the Korean peninsula.*

flower; in others the trees were stunted, flowerless, and almost completely defoliated. We were surprised to see a number of recent roadside plantings, not just single rows, but groves of trees planted by the dozen. We hoped that the trees had come from a local source so that the local wild population would not be threatened by genetic contamination.

A wet, gusty typhoon limited our activities over the next few days. The gas-exchange system does not work well in a downpour, and the steep and rocky slopes would have been difficult to traverse even in the driest of weather. We spent most of our time delimiting the boundaries of the population and taking samples for future genetic analysis. Trees at this site grew both on the shore—or, rather, on the cliffs above it—as well as up to a kilometer inland, in valleys protected from the marine environment. In these valleys we found many trees exceeding

12 m in height and 30 cm in dbh—by far the largest we had seen so far and all in full bloom. By contrast, near Tae Bo 1-Ri, where the ocean spray was greatest, we found fewer than 20 windswept trees, all stunted, none more than 3 m tall and 15 cm in dbh, and all lacking flowers as well as most of their leaves—good examples of elfinwood.

In Balsan 1-Ri, one of the fishing villages that lay along the road beneath the steep slopes, we stopped at a restaurant named Mogamchoon-amu, after the goldenrain tree. Beaming with pride at our interest in the trees, the owner told us the same thing we had heard elsewhere: she did not know their origin but it was common knowledge that they had been there longer than anybody could remember.

Although some trees were being lost as hill-sides crumbled under the pressure of increased development, the Pohang population was large

and thriving compared to those we had previously visited and appeared to be confronting fewer threats from either nature or humans. Whereas elsewhere the trees grew in small patches at the very edge of the beach, here they spread from shoreline to inland valleys. Another difference was that many of the trees here grew atop crags and rocky outcroppings, high above the surf where they were not likely to have been planted to protect homes and gardens. In fact, as we gazed at these trees, glowing golden even in the rain and mist, we wondered if they had been planted at all.

### Woraksan

With its mixture of coastal and inland environs, Pohang was a perfect transition to our final destination: Woraksan, the 1,093-m-high mountain located in central South Korea. On June 25, as we headed west through spectacularly beautiful mountains, the fishing villages soon gave way to agriculture. Woraksan ("Moon Crags Mountain") lies within a national park that encompasses temples, stone Buddha statues, and a fortress dating from at least the seventh century.

*Koelreuteria* grows in two areas on the mountain, one near the Buddhist hermitage of Podogam and the other in Joonbong Valley, several kilometers away. Getting to Podogam required a treacherous drive up a rugged road followed by a hike up the steep trail that leads to the mountain's peak. The hermitage, perched on one of the mountain's western ridges at about 400 m, comprised a temple, two lodges for visitors, and several small outbuildings. The site's rich history includes an account from the Unified Shilla Dynasty (668 to 918 AD) of an exiled emperor's son who took refuge in the adjacent Wang Li Cavern.

We found 36 mature trees here, mostly along the crest of the ridge. Like the trees on Yongil Bay, they grew on steep, rugged terrain, with many sprouting from cracks in the cliffs and between large rocks. They were smaller in girth than the trees at Pohang and Wando yet far more upright, likely the combined result of competition for light and absence of salt spray and wind. A precipice above the upper canopy of one of the larger trees allowed us to

measure its photosynthetic rates. From this perch we got not just vertigo but also a good view of the early flowering in the trees below; we estimated that they were about a week behind those in Pohang.

The flora at this site included many species we had not seen on the coasts. We counted many Amur maples (*Acer tataricum* ssp. *gin-nala*), kousa dogwoods, and a few large, flowering *Tetradium danielli* (a close relative of the Amur cork tree, *Phellodendron amurense*) and *Ailanthus altissima* (tree of heaven). The rich shrub layer contained such familiar garden taxa as Korean boxwood, spireas, *Euonymus alatus* (burning bush), and *Philadelphus* (mockorange). There were also vines such as *Parthenocissus tricuspidata* (Boston ivy), *Akebia quinata*, and the ever-present kudzu.

In the hot afternoon sun, we took a break from measurements and enjoyed a cold watermelon with the monk, Sung Kwan. He began our discussion with a synopsis of the web of all living things: plants, insects, a nearby family of black-and-white rabbits, ourselves. We hoped that our questions about goldenrain trees would elicit local legends, but instead he matter-of-factly told us that they were obviously natural elements of the mountain. When we probed further, he said that he found the trees unattractive and of so little value that he could see no reason anybody would have introduced them. He was also certain that the seeds were far too small to make Buddhist rosaries, contrary to what we had read earlier. Certainly not the responses we had anticipated.

After our chat, he led us down the path through the *Koelreuteria* grove to the Wang Li Cavern, the site of a Buddhist shrine and a spring. Directly in front of the cavern was a pool of water spanned by a rustic wooden bridge and surrounded by a dense colony of *Artemisia vulgaris* (mugwort). On the right side of the cave's mouth stood a *Taxus cuspidata* (Japanese yew) and on the left, a goldenrain tree. Suspended from a branch of the latter was a small brass bell that jingled in the breeze, adding to the atmosphere created by the spectacular valley view and the strong smell of camphor from the mugwort. The human footprint on this mountain stretches at least back to the Goryeo



Dynasty (57 BC to 668 AD), when the nearby Dongmun fortress was built, and contrary to the monk's assertion we were quite sure that at some time in that long history *Koelreuteria* was introduced at Woraksan.

We spent the next day, our last on the mountain, investigating a population of goldenrain trees in the nearby Joonbong Valley. In an earlier report<sup>14</sup> Son numbered this population in the hundreds, but after an arduous hike we found only about 25 individuals in an isolated patch on a ridge at 395 m. Most were juveniles; only a few of the larger trees had flowers. Certain that this could not be the population mentioned by Son, we spent several more hours exploring the area but failed to find more *Koelreuteria*, and we headed back down the mountain at dusk.

Before leaving for Seoul the next morning (June 28), we returned to the valley for a quick examination of a streambed to the south of the ridge where we had found the small population the day before. Almost immediately, we found hundreds of *Koelreuteria* lining the very edges of the rocky waterway. Many were exceptionally large, a few exceeding 15 m in height and 35 cm in dbh. Nearly all were multistemmed, and again we saw evidence of basal sprouting following disturbance, in this case subsidence of the unstable banks. In fact, we saw very large trees, some still alive, that had been uprooted and washed downstream. Water, wind, and gravity are known dispersal agents for the marble-like goldenrain tree seeds; here we saw that entire trees, not just seeds, could be dispersed by flowing water. Although we



Tom Whitlow uses the LiCor 6400 to measure photosynthesis on a tree growing near the Buddhist hermitage at Podogam on Woraksan. The real-time photosynthetic rate (expressed as the rate of  $\text{CO}_2$ ) is determined after inserting a leaf in the unit's cuvette, seen attached to a tripod on the righthand side of the image.

never determined the entire size of this population, we were confident that it continued for a considerable distance toward the crest of Woraksan.

On June 30, we visited the Korca National Arboretum, about an hour's drive north of Seoul. After a wonderful tour of the grounds, we met with several KFRI research scientists who were familiar with *Koelreuteria paniculata*. We were surprised to learn from Kim Sung-Sik that two bird species, the brown-eared bulbul (*Hypsipetes amaurotis*) and the rufous turtledove (*Streptopelia orientalis*), have occasionally been observed foraging in the Arboretum's goldenrain trees. Rather than eat the seeds, the birds usually drop them short distances

away. None of the literature on goldenrain tree mentions seed dispersal by birds, but this behavior could explain the presence of populations on the high cliffs of Pohang and on the isolated ridge at Woraksan, making birds yet another dispersal vector in addition to wind, water, gravity, and people.

Our first goal when we embarked on this tour had been to study the Korean goldenrain trees in their natural (or unnatural) environs. We were expecting to find uncultivated populations regenerating on their own and blending with other natural elements of the landscape. At two locations, Pohang and Woraksan, this is exactly what we found. We were not expecting the heavy human influences we found at Anheung, Anmyondo, and Wando, however, where the populations resembled plantations not long out of management. Nevertheless, we concluded that all the sites we visited reflected the essential nature of *Koelreuteria* in Korea: all are components of cultural landscapes that are intertwined with local traditions ranging from Buddhism to coastal homesteading. And we believe that each population, whatever its origin, now represents a unique cultural landrace



A goldenrain tree stood at the mouth of the Wang Li Cavern, near Podogam, the Buddhist hermitage on Woraksan.

that should be preserved, just as we preserve landraces of crop plants.

The second reason for our trip was to learn how goldenrain tree responds to a coastal environment where it must cope with the stresses of salt-spray and other disturbances. The intense monsoon rains we encountered on many days actually provided valuable insights in this regard. As tender leaves emerge in spring, they become stressed from the constant salt spray. This progresses from chlorosis and cupping to death in severe cases, particularly in leaves at the windward edges of the canopy. When these early leaves are damaged, as we observed during our visit, a second set of buds below them is released from dormancy and a new flush occurs with the onset of the monsoon season, producing leaves that are likely to last through the rest of the summer. Although salt is no doubt deposited on the new leaves, the frequent rains rinse much of it away, a process likely facilitated by the curling of the leaves. And, we learned that despite visible signs of salt injury, leaves could still photosynthesize at moderate to high rates. Stem- and root-suckering, a strategy for mitigating the effects of stress and disturbance, help the trees survive



in these sites and may explain the low levels of within-population genetic variation reported in earlier studies. The combination of all these factors may be the source of the species' survivability at these coastal sites.

Regardless of how *Koelreuteria paniculata* arrived on the Korean peninsula, the trees are entrenched in local custom and deserve to be preserved for generations to come, for their cultural as well as scientific significance. The South Korean government's protection of most of these populations is commendable, but the lack of appropriate management threatens the trees' long-term survival. For example, clearing the understory at Anmyondo has limited potential regeneration, both seedling and clonal, and the roadside trees planted near Pohang could contaminate the local gene pool if they are not derived from local source. We strongly recommend a centralized management plan that includes long-term demographic monitoring and evaluation, less intrusive maintenance measures, and preservation of germplasm in *ex situ* repositories.

#### Endnotes

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- <sup>9</sup> S. A. Spongberg. 1978. Korean adventure. *Arnoldia* 38: 132–152. Specimens from these two separate collections can be admired at both arboreta. Meyer's collection (KT 74) yielded Morris Arboretum accessions 81-333 ADEFH, and Spongberg and Weaver's collection (SW 356) produced accessions 1605-77ABC for the Arnold Arboretum.
- <sup>10</sup> S. W. Lee et al. 1997. Characteristics of leaf morphology, vegetation and genetic variation in the endemic populations of a rare tree species, *Koelreuteria paniculata* Laxm. *Journal of the Korean Forest Society* 86: 167–176; Son et al., 2000; K. B. Yim, et al. 1994. RAPD variation in three distantly isolated populations of *Koelreuteria paniculata* growing in Korea. *Research Reports of the Forest Genetic Research Institute of Korea* 30: 93–98.
- <sup>11</sup> The names for the local sites (Mollipo, Chollipo, and Paengnipo) reflect the relative sizes of their bays: the suffix "-po" means bay, while the prefix "moll-" means large (c. 10,000), "choll-" means medium (1,000) and "paengni-" means small (100).
- <sup>12</sup> Spongberg, 1978, describes both the young garden and their host of 25 years ago.
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#### Acknowledgments

Our trip would have been impossible without support for the American participants. Tom Whitlow received funding from the International Travel Grant Program of the College of Agriculture and Life Sciences (Cornell University), and Michael Dosmann received funding from the Mario Einaudi Center for International Studies (Cornell University) as well as a Deland Award from the Arnold Arboretum. We are grateful to these institutions for their assistance. The Americans also thank their very gracious colleagues, Dr. Kang and Mr. Young, for their friendship and assistance. Thanks also to Jacob Barney for his assistance in creating the map and for providing insightful comments on the manuscript.

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## Che: Chewy Dollops of Maroon Sweetness

Lee Reich

**A**mong the attractive qualities of *Cudrania tricuspidata*, the fruit—for me—is the main draw. In fact, I wish that I had become better acquainted with che, one of the plant's common names, soon after our introduction. That first meeting was in 1979 at the home of renowned fruit breeder George M. Darrow, then ninety years old and retired from the U.S. Department of Agriculture. His dooryard che, unfortunately, had no fruits ripe for sampling. In the years that followed, I occasionally

happened upon the plant on the printed page where I found lukewarm descriptions of the fruit's flavor—"mild watermelon," for example. Almost twenty years after our introduction I decided, finally, to plant a che and evaluate the fruit for myself; a year later I tasted my first fruit. It was very good and nothing like a "mild watermelon."

Were you to meld all the characteristics of a fresh fig and a mulberry—both, incidentally, relatives of che—you would end up with some-



LEE REICH

*Che's aggregate fruits combine the flavors of fresh figs and mulberries: neither quite as rich as a fig nor quite as sweet as a mulberry.*



thing very close to a che fruit. To wit, che is an inch to an inch-and-a-half across, round, and a dull maroon with a rich red interior, a slightly chewy texture, and a few edible seeds. The flavor is most definitely fresh fig plus mulberry although neither quite as rich as the fig nor quite as sweet as the mulberry.

Che, like mulberry and fig, is an aggregate fruit, the individual fruitlets more or less coalesced. The surface texture most closely resembles that of yet another relative, the osage orange (*Maclura pomifera*), whose four-inch-diameter, green-skinned orbs are completely inedible. Deliberate hybrids—with the euphonious and likewise hybrid name *Macludrania hybrida*—have been created between osage orange and che, the first in France in the latter half of the nineteenth century. The goals for creating such hybrids were not specified—perhaps a baseball-sized che fruit?—but the original ones, using che as the male parent, most closely resembled their father in plant form. Hybrids derived from those French plants were planted at the U.S. National Arboretum in 1960 and were said to look like thornless osage orange trees. Their hybrid origin has since been questioned and, in any case, little mention has been made of their fruits.

Che fruit itself is rarely mentioned, even in writings from China where che is native. The plants have been valued by the Chinese for their leaves, as feed for silkworms. Although the silk produced from them was said to produce lute strings with a particularly clear sound, their leaves were used only to supplement mulberry leaves as feed, perhaps because thorny stems make picking them more difficult.

It was in the latter half of the nineteenth century that che first made its way to the Western world. It has been grown in France since 1862 and in England since 1872 with no mention made of its fruit production or use. It first arrived in America in 1909 among a few thousand other cuttings and live plants sent over from China by E. H. Wilson. By 1912, a tree at P. J. Berckman's Nursery in Augusta, Georgia—presumably derived from that introduction—was twelve feet high and bearing a bushel and a half of fruit. The following year another shipment arrived from China, sixteen

rooted plants sent over by the U.S. Department of Agriculture's plant explorer Frank N. Meyer for testing in drier regions as a hedge plant for gardens and a living fence for farms and, in less arid regions, for bank stabilization.

Today, che remains relatively unknown as a fruit or a plant, despite the plant's early and reliable fruit production, its resistance to pests, and its probable (judging by the closely related osage orange) wide adaptability. It even lacks a widely accepted common name, having been also called cudrang, mandarin melonberry, silkworm thorn, and—derivation unknown—storehousebush in English, and in China, *tcho sang* (wild mulberry), *tsa*, *tse-tsang* (thorny mulberry), *cha-shu*, *poh-hsi*, *shih*, *nu-che*, and, of course, *che*. Yet, given the quality and productivity of even unselected seedlings, che is surely an uncommon fruit worthy of attention, especially if some of that attention were directed to selecting or breeding plants that were thornless, bore well without pollination, and ripened earlier.

### The Plant

*Cudrania triloba* has been variously described as a large shrub or a small tree usually growing to a height of about twenty feet, occasionally soaring to sixty feet. Some suckers are produced at the base of the plant and, with age, the tree develops a spreading, flattened top and a bark that ripples with deep furrows. A sprawling, almost vine-like habit has been ascribed to some of the shrubbier sorts. But many kinds of plants change morphologically (beyond attaining the capacity to flower) as they transition from juvenility to maturity. As examples, citrus lose their thorns and English ivy changes from a vine to a woody shrub. Vining behavior and increased thorniness could merely be descriptions of juvenile che plants.

Che's thorns are an unresolved issue. Although the plant is typically thorny, branches higher up in older plants frequently are thornless. Dr. Darrow propagated two plants from thornless branches and, while one of the two remained thornless, the other eventually grew thorny new shoots. The question arises, then, whether we have here a chimera—a plant made up of two kinds of genetically dissimilar cells,





*E. H. Wilson photographed these two Cudrania tricuspidata in August 1918 in Japan, where they had been planted roadside. He noted that they were forty feet in height and in girth of trunks, four and seven feet.*





Frank N. Meyer's photograph of this very interesting trunk is dated January 1914. His legend reads, "Cudrania triloba. Village of Yo tze ko, south of Sianfu, Shensi China. The peculiar looking trunk of a Chinese osage-orange called 'Teho che shu.' The leaves are occasionally used for feeding silkworms. Locally the small red fruits are considered unwholesome."

in which new plants propagated from one set of cells may be thornless and from the other set thorny—or perhaps it is merely a question of juvenility versus maturity, with juvenile stems, as in citrus, being the thorny ones. In that case, plants propagated from vigorous stems near the base of a seedling tree will be juvenile and thorny while those propagated from stems higher in the tree will be mature and thornless. Cytological studies and observation of seedling plants as they mature would resolve this issue.

The shape—or, I should say, shapes—of che's leaves are similarly variable. In 1877, a Dr. Hance, who had assigned to che the botanical name *Cudrania triloba*, wrote that it was "an unfortunate specific name, as the foliage seems highly variable." The plant's specific name was later changed to *tricuspidata* although the leaves are sometimes entire or indistinctly lobed and sometimes three-lobed. Increased lobing of leaves, incidentally, is another characteristic of plant juvenility that might be lost with maturity, another change exemplified in maturing English ivy plants. Che leaves remain healthy and green throughout the growing season, then drop without fanfare.

Che flowers are as hard to pin down morphologically as are the leaves. Mostly, plants are either male or female (dioecious), but male trees frequently bear some fruits (which only follow female flowers) and female trees frequently yield good crops without male pollinators. Like some varieties of persimmon, male or female che plants might bear a few flowers, perhaps whole branches, of flowers of the opposite sex. This explanation seems more likely than parthenocarpy because ripened fruits typically have a few seeds in them, which indicates that pollination did occur—unless che is among the few plants capable of producing seeds solely from mother plant tissue, without pollination (i.e., it is apomictic). The waters are further muddled by a possible link between thorniness and gender; Dr. Darrow observed that, on one plant at least, thorny stems acted like males: they were fruitless but their presence made female stems fecund. Gender questions could be answered with close observation and controlled pollinations.

Che flowers—small, yellowish-green in rounded heads—are reliably borne, either singly or in small groups, in the axils of leaves on growing shoots. Fruiting is equally reliable because the flowers open late, about the time that mulberry fruits are just starting to ripen. Plant a che tree and it will not have you waiting long for those first flowers or fruits; my plant—a clone—yielded both the year after planting.

### Cultivation

The etymological meaning of "che" is "stony ground," indicating its natural habitat. Just because it tolerates drought and poor soil does not mean that it would thrive best and yield the most luscious fruits on such ground. I give my che the same good soil—well cultivated, moderately fertile, and humus-rich—enjoyed by my other fruits. Good drainage is important.

Che is said to prefer a warm soil. This requirement probably has basis, especially if a warm soil infers also a warm site, because in northern regions such a site would be needed to ripen the relatively late ripening fruits. The plant itself is hardy to USDA zone 5 or 6 and also grows well into subtropical regions, although individual clones might better tolerate either end of this climate spectrum.

Che is a plant that performs well with little or no regular pruning. Prune the young plant so that each of its main branches has plenty of room, then, when the plant matures, do nothing more than cut off any dead, broken, or out of place branches that you might find. Drastic shortening of any branches that become decrepit will stimulate vigorous, new shoot growth on which flowers and fruits are borne.

You may want to prune the tree more heavily if you are feeling regal, in order to extract a reddish yellow dye from the pruned stems. The Chinese used so-called "che yellow" for coloring imperial garments.

### Propagation

Che is easy to propagate by any one of a number of methods. Seeds germinate readily if sown immediately upon removal from the fruit, or, if stored, after a period of cool, moist stratification. Be forewarned, though: seedlings may take up to a decade to bear fruit.





*The leaves on these branches of Cudrania tricuspidata appear to have lost their juvenile variability.*

As previously mentioned, cloned plants bear at a very young age. Take semi-hardwood cuttings after midsummer, ideally treating them with rooting hormone and then putting them under mist. Root cuttings are another method of clonal propagation.

Che takes well to all sorts of grafting techniques. Grafting seedlings onto mature plants is one way to shorten the juvenility period and so more quickly evaluate their fruits. Create more robust and tree-like specimens by grafting che on osage orange rootstock.

### Harvest and Use

Although che fruits ripen late in the growing season, be patient with their harvest because they are tasteless until softened and dead ripe. Do not expect the fruits to drop into your hands at that time; each che has to be plucked individually (a case for parthenocarpy). Likewise, do not expect to pick the fruits all at once, because

they have a long ripening season, a month or more. Here in New York (zone 5), my che fruits begin ripening about the middle of October, about the same time as has been reported from the mountains of Virginia and a couple of weeks after times reported from near Washington, DC. Reports of first ripening in November in California and August in Georgia possibly highlight different ripening seasons for different clones.

Che bears heavily—Darrow reported hundreds of pounds on a mature female tree. What fruits you cannot eat at one sitting will keep for several days under refrigeration. Still more than you can eat? Blend the fruits, then strain out the seeds for a delicious nectar.

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Formerly a fruit researcher for the United States Department of Agriculture and Cornell University, Lee Reich, PhD, is currently a garden writer and consultant ([www.leereich.com](http://www.leereich.com)). Che is one of the fruits featured in his book *Uncommon Fruits for Every Garden* (Timber Press, 2004).







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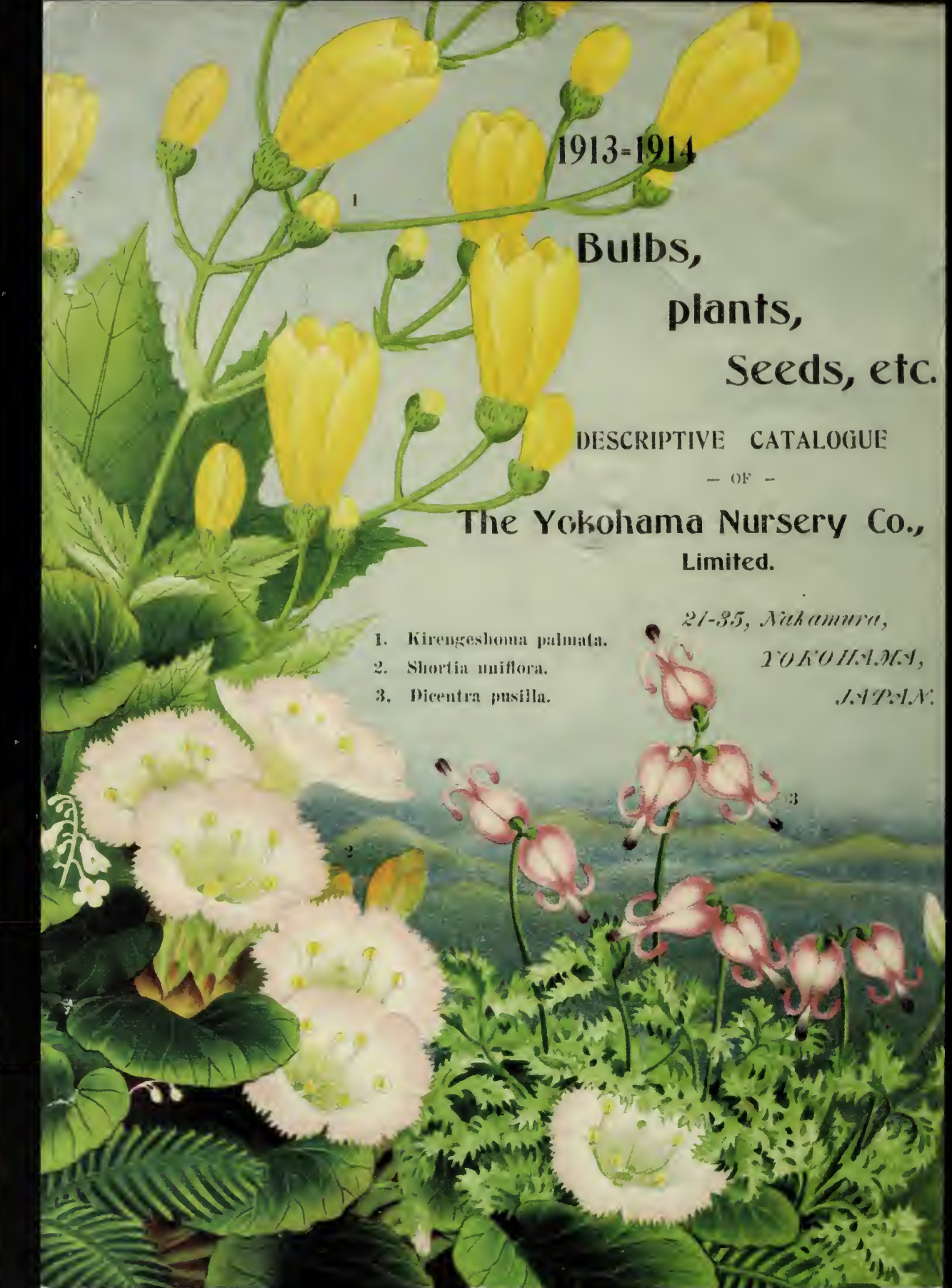
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## Volume 64 • Numbers 2–3 • 2006

*Arnoldia* [ISSN 004-2633; USPS 866-100] is published quarterly by the Arnold Arboretum of Harvard University. Periodicals postage paid at Boston, Massachusetts.

Subscriptions are \$20.00 per calendar year domestic, \$25.00 foreign, payable in advance. Single copies of most issues are \$5.00; exceptions, including this issue, are \$10.00. Remittances may be made in U.S. dollars, by check drawn on a U.S. bank; by international money order; or by Visa or Mastercard. Send orders, remittances, change-of-address notices, and other subscription-related communications to Circulation Manager, *Arnoldia*, Arnold Arboretum, 125 Arborway, Jamaica Plain, Massachusetts 02130-3500. Telephone 617.524.1718; facsimile 617.524.1418; e-mail [arnoldia@arnarb.harvard.edu](mailto:arnoldia@arnarb.harvard.edu).

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*This double issue celebrates the Arnold Arboretum's Larz Anderson Collection of Dwarfed Japanese Trees. At one level, it presents its history from their arrival in America in 1913 to the present; at another, it is a microcosm of cross-cultural exchange between Japan and the West. Among the thousands of plants shipped from Japan in the late nineteenth and early twentieth centuries, the trees in this collection are among the very few survivors left to tell the tale.*

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*Front cover:*  
*Chamaecyparis obtusa*  
'Chabo-hiba', Arnold Arboretum #877-37, the oldest plant in the Larz Anderson Collection, started in 1737. Photographed in 2005 by Dave Henderson.

*Inside covers:* The front and back covers of the 1913–1914 Yokohama Nursery catalogue.

*Back cover:* The cover of the 1905 Yokohama Nursery catalogue. Note the 'Chabo-hiba' logo in the upper left hand corner.



Item #349 from the 1904  
Boston Auction Catalogue.



# FROM TEMPLE TO TERRACE

*The Remarkable Journey of the Oldest Bonsai in America*

*Peter Del Tredici*

**T**he Larz Anderson Collection of Japanese Dwarfed Trees at the Arnold Arboretum was originally imported into the United States by the Honorable Larz Anderson in 1913, upon his return from serving as ambassador to Japan. The core of the collection consists of seven large specimens of compact hinoki

cypress (*Chamaecyparis obtusa* 'Chabo-hiba')—between 270 and 145 years old—that Anderson had purchased from the Yokohama Nursery Company (Figure 1). While these are certainly not the oldest Japanese dwarfed trees in the United States, they have been under cultivation longer than any other plants currently growing



Figure 1. Portrait of 'Chabo-hiba' #881-37 started in 1862. It stands 110 centimeters tall by 140 centimeters wide. Photographed in 2002 by Colin Lewis.

in North America. To be sure, dwarfed trees had been imported into the United States from Japan prior to 1913, but none of these plants are alive as far as I have been able to determine.

The fact that the Larz Anderson Collection has survived the ravages of both time and occasional neglect for the past ninety plus years is not only a testament to the care it has received, but also to the incredible durability of the plants themselves. In a very real sense, the 'Chabo-hiba' hinoki cypresses in the Larz Anderson Collection provide a direct link to the early 1900s, when the wealthy Americans and Europeans, infatuated with all things oriental, were passionately collecting cultural artifacts from Japan, and the Japanese, in their headlong rush to modernize, were only too willing to oblige this passion. The purpose of this book, then, is two-fold: to document the spirit of the early twentieth century as it relates to the importation of ancient bonsai plants from Japan into North America, and to show how this spirit has been miraculously preserved in the ancient 'Chabo-hiba' specimens that today make up the Larz Anderson Collection of the Arnold Arboretum.

### The Yokohama Nursery Company

The story of the Larz Anderson Collection really begins with events that took place in July 1853 and February 1854, when Commodore Matthew C. Perry, led two separate armadas of American "black ships" into Edo Bay, and forced the Japanese government to open its ports to trade with the United States. This initial opening eventually led to establishment of the Meiji Restoration in 1868, which marked the end of the Tokugawa dynasty that had ruled Japan since 1603. The Meiji government moved quickly to establish new political boundaries, instituted a new land tax system, and actively encouraged the development of an economy based on manufacturing and heavy industry. In an effort to speed up this modernization process, the government paid some three thousand foreign technical experts to come to Japan to start new businesses and train Japanese citizens to run them.

One of these foreign experts was Louis Boehmer, a German citizen who had immi-



THUYA OBTUSA, VAR. CHABO-HIBA,  
FAMOUS JAPANESE DWARF CONIFER 120 YEARS IN POT.  
(See Conifers Page 27).

Figure 2. A 'Chabo-hiba' wood cut from the 1892 Yokohama Nursery catalogue. Illustration courtesy of the United States National Arboretum.

grated to America around 1866 and become a successful gardener in Rochester, New York. He next moved to Japan in 1872 to head a government-owned farm that was operated by American agricultural officials. After the break-up of this farm, Boehmer established his own nursery in 1882, which specialized in exporting Japanese plants to Europe and the United States. In 1890, Boehmer sold his company to his German partner, Albert Unger, who operated it with his American wife, Mary, until 1908 (Creech, 1988).

At roughly the same time that Boehmer sold his nursery to Unger in 1890, a group of four Japanese nurserymen established the Yokohama Gardeners Association with the purpose of exporting Japanese plants to the west. One of these original founders of this cooperative was Uhei Suzuki, who had worked for Boehmer for seven years previously. In 1892, the Yokohama Gardeners Association issued their first English catalogue that offered both green and gold





Figure 3. "*Thuja Obtusa*, var. *Chabo-hiba*. Specimens of the famous Japanese minimized tree, above 100 years in pots." Woodcut from the 1901 Yokohama Nursery catalogue.

## DWARFED TREES GROWING IN JARDINIERS AND THEIR CULTURAL DIRECTIONS.



A RARE SPECIMEN OF DWARFED THUJA OBTUSA, (400 YEARS OLD.)  
THE YOKOHAMA NURSERY CO., LTD.

Figure 4. "A rare specimen of dwarfed *Thuja obtusa* (400 years old). A relic of the Tokugawa Era." Illustration from the 1905 Yokohama Nursery catalogue. Note the same type of concrete container in Figure 7.

'Chabo-hibas' for sale and was illustrated with a woodcut of a spectacular, 120-year-old potted 'Chabo-hiba' specimen (Figure 2). At some point between 1893 and 1894, the Yokohama Gardeners Association was re-organized into the Yokohama Nursery Company under the

leadership of Uhei Suzuki and his son Hamakichi (Elias, 2005).

The Yokohama Nursery Company catalogues from the mid-1890s through the mid-1920s are impressive documents, written in English and beautifully illustrated with colored plates, line drawings, and photographs of classic Japanese garden plants (see back and inside covers). Many of the colorful wood block prints were created by Tokejiro Hasegawa, one of the premier artists of his day. The 1901 catalogue contains a beautiful woodcut of three specimens of "*Thuja obtusa* var. *Chabo-hiba*" with the label, "the famous Japanese minimized tree, over 100 years in pots" (Figure 3). The 1905 and subsequent catalogues feature a photograph of a magnificent, 400-year-old 'Chabo-hiba' specimen that was labeled "A relic of the Tokugawa Era," (Figure 4).

The Yokohama Nursery Company's listings of "Dwarfed Trees Growing in Jardinières" featured a wide variety of both conifers and flowering trees in a range of sizes, and included remarkably detailed instructions, written in flawless English, on how to care for these dwarfed trees once they arrived at the customer's home (see page 63). Interestingly, none of the Yokohama Nursery catalogues used word *bonsai* to describe the plants they offered for sale. The section on dwarfed plants was typically only a small part of the catalogue, which often ran over eighty pages long and featured an incredible array of plants, seeds and bulbs. They sold both wild species and horticultural

varieties, along with an amazing selection of pots and other decorative objects for the garden and greenhouse. Numerous photographs of the nursery operation were published in the catalogues (Figure 5) which portray a prosperous, well-organized business. Many famous horti-



HEAD OFFICE OF THE YOKOHAMA NURSERY CO., LTD.



ARBOR OF THE YOKOHAMA NURSERY CO., LTD.

Figure 5. Photographs of main office and grounds of the Yokohama Nursery Company from the 1908 catalogue.



culturists from Europe and the United States visited the nursery, including E. H. Wilson of the Arnold Arboretum, who took a number of photographs of the grounds in 1918. Among his pictures is one which shows a impeccably groomed 'Chabo-hiba' (Figure 6), and another which shows a large group of 'Chabo-hibas' growing in the distinctive concrete containers as well as in the ground (Figure 7).

At the turn of the nineteenth century, there were at least twelve Japanese nursery companies exporting dwarfed trees and other nursery products to the west. Without question, 'Chabo-hiba' was the most common type of dwarfed tree being exported between 1890 and 1920. Many of the specimens offered for sale were hundreds of years old and had once



Figure 6. A beautiful 'Chabo-hiba' specimen at the Yokohama Nursery Company, photographed on June 7, 1918 by E. H. Wilson. The caption reads, "*Chamaecyparis obtusa* var. *nana* Carr. Genuine dwarf tree about 70 years old. Value 50 yen."



Figure 7. A large group of pruned 'Chabo-hibas' at the Yokohama Nursery Company, photographed on June 7, 1918 by E. H. Wilson. The caption reads, "*Chamaecyparis obtusa* var. *nana* Carr. Group of trained specimens. *Tsuga diversifolia* Maxim. In center." Note the concrete containers similar to those in Figure 4. The tall specimens in the background are also 'Chabo-hibas'.

occupied places of honor in temples throughout Japan. They were usually trained into a conical shape—suggestive of a distant mountain—with regularly arranged, horizontal branches.

At roughly the same time that these traditionally trained trees, properly known as *hachi-no-ki*, were being shipped off to Europe and America, trees grown in the more modern, naturalistic *bonsai* style was gaining in popularity in Japan (Matsuki, 1931; Marushima, 2005). In this regard, the ancient specimens of 'Chabo-hiba' were no different than some of the other artifacts of traditional Japanese culture, which were being sold off to the highest bidder during the country's headlong rush to modernize.

## DWARFED TREES AT NINETEENTH CENTURY INTERNATIONAL EXPOSITIONS



JAPANESE BUILDING.

Figure 8. *The Japanese pavilion from The Centennial Exposition, Described and Illustrated, by J. S. Ingram, 1876.*

One particularly significant manifestation of Japan's opening up to the west was its participation in various international expositions which provided the opportunity to showcase its culture, its arts, and its commercial products, often in a garden setting. The famous "Centennial Exposition" held in Philadelphia in 1876 featured a Japanese pavilion along with a house and garden (Figure 8). The exhibit contained at least one dwarfed tree in a pot, most likely a specimen of 'Chabo-hiba':

In a box of blue porcelain, with white raised imitations of beets, carrots, etc., on the outer surface, and having porcelain supports of the size, shape and color of turnips, was a stunted cedar tree sixty years old and not more than thirty-two inches in height. The spread of its branches was four and half feet in the widest part. The trunk was eight inches in diameter. (Ingram, 1876)

The first extensive display of dwarfed trees outside of Japan occurred in Paris in 1878, during the famous "L'Exposition Universelle," and caused a sensation in the French horticultural world. Elie-Abel Carrière wrote an article about the exhibition in *Revue Horticole* in 1878, which contained illustrations of some of the

more spectacular plants (Figure 9). A second Paris Exposition, in 1889, featured an equally dramatic display of Japanese dwarfed trees, including several specimens of 'Chabo-hiba', which were illustrated in another *Revue Horticole* article by Carrière (Figure 10).

The first significant display of Japanese dwarfed plants in the United States took place at the "World's Columbian Exposition" held in Chicago, Illinois in 1893. The Japanese exhibit featured an elaborate building and a garden with several potted specimens of 'Chabo-hiba', which were probably supplied by the Yokohama Gardeners Association (Elias, 2005). In the March 15, 1893 issue of *Garden and Forest*, Charles Sprague Sargent, director of the Arnold Arboretum, described the sad history of one particular plant, no doubt a 'Chabo-hiba', which never made it into the display:

A remarkable dwarf Cedar, known to be three hundred years old, was sent some time ago to the Chicago Fair by the Emperor of Japan. It seems strange to learn that it was prepared for transportation by being taken from its pot and wrapped in paper; and not at all strange that when it reached Jackson Park it should have been nearly dead.



beaucoup d'autres, ou qu'ils sont plus | Pins qu'ils soumettent à ce traitement.  
goûtés par les Japonais. Ce sont surtout des | Les figures 55, 56 et 57 montrent des ré-



Fig. 55. — Jeune *Pinus densiflora* soumis au monstruosisme.



Fig. 56. — *Pinus densiflora* soumis au monstruosisme.



Fig. 58. — *Rhynchospermum japonicum* rendu monstrueux par la culture.



Fig. 57. — *Pinus densiflora* rendu difforme par le traitement (au 1/8 de grandeur naturelle).



Fig. 59. — *Schiraga m'ats'u* (*Pinus densiflora*, var. *albifolia*).

(Voir, pour la description, *Revue horticole*, 1874, p. 273.)

sultats remarquables, qui nous paraissent difficiles à expliquer, sinon hypothétiquement. En effet, la tige, très-réduite, est placée plus ou moins haut, à l'extrémité de nombreuses racines simples ou ramifiées qui semblent nager dans l'air et qui, supportées par des tuteurs, descendent et viennent

s'implanter dans la terre du vase pour y



Fig. 97. — *Retinospora obtusa breviramea*, âgé de 80 ans et l'autre de 150 ans.

Figure 10. Two specimens of 'Chabo-hiba' illustrated in E.-A. Carrière's 1889 article "Japonaiseries," published in *Revue Horticole*. The plants, which he labeled *Retinospora obtusa breviramea*, were 80 and 150 years old respectively and 70 to 80 centimeters tall.

Every effort was used to resuscitate it, but a few days ago it died. Nevertheless, its defunct form will be carefully set in a pot and exhibited in the Horticultural Building. It is described as a remarkable example of the skill of the Japanese in retarding the growth of trees and yet preserving, in miniature, the aspect of an ancient, weather-worn specimen. It is larger than the most interesting of these dwarfs which were shown at the Paris Exhibition [see Figure 10], being about three feet in height.

Five months later, in the August 30, 1893 issue of *Garden and Forest*, Liberty Hyde Bailey of Cornell University described two other 'Chabo-hiba' in the Columbian Exposition that survived the long journey from Japan:

There are many curious plants in this garden. The chief interest centers about two twisted trees of *Thuja obtusa*, which are three to four feet high, and a hundred years old. This Japanese garden cannot be called beautiful, as Americans understand rural art, but it is curious and gro-



Figure 11. A 'Chabo-hiba' at the World's Columbian Exposition in Chicago. Photograph from The World's Columbian Exposition, Chicago, 1893 by White and Igleheart.

tesque, and it is one of the best object-lessons in the art of patient and persevering garden-craft. (Figure 11)

A third article about the Japanese exhibit appeared in the September 6, 1893 issue of *Garden and Forest*, which reprinted the text of a public lecture by Henry Izawa, the gardener of the Imperial Japanese Commission to the Columbian Exposition. He described the methods used by the Japanese to produce dwarfed plants as well as the techniques of propagating 'Chabo-hiba':

We give plenty of fertilizer to the plants of *Thuja Lobbi*, and, in early spring, take two-inch shoots of *Thuja obtusa*, cut the ends slantwise and insert them in the smaller portions of the *Thuja Lobbi* trunk, using one graft to every inch on the trunk. We then wrap the grafts with rice straw and take them to a shaded, windless room with the temperature of thirty-five degrees Fahrenheit. For three weeks the temperature is raised one or two degrees daily, and by that time a little breeze may be admitted; the temperature of the room is kept at sixty degrees for two weeks, and at seventy degrees for two weeks, and then leaves will start from the grafted twigs. In the latter part of spring, when the temperature in and out-of-doors becomes uniform, the plants can be safely transferred to some shady position out-of-doors. In the fall, when all the grafts have taken good hold, all the remaining shoots of *Thuja Lobbi* are cut off. Transplant every year in good rich soil; six years will be sufficient to produce handsome specimens of dwarfed *Thuyas*.



## DWARFED TREES SOLD AT PUBLIC AUCTIONS

In addition to the sale of dwarfed plants through Japanese nurseries, public auctions were another important channel for the dissemination of particularly choice 'Chabo-hiba' specimens to the west. Given their ephemeral nature, these auctions received only limited publicity, and there is precious little evidence of their occurrence. Indeed, only three catalogues for these major auctions are known to exist, all of which I was fortunate to obtain copies of. The oldest catalogue is from 1899, for an auction held in Boston, Massachusetts, and was generously provided by Mr. Michael Levin, owner of "Bonsai West" in Littleton, Massachusetts (Figure 12). A photocopy of the 1900 London auction catalogue came from Mr. Harry Tomlinson of Nottingham, England (via Dr. Tom Elias of the United States National Arboretum in Washington, D.C.). And finally, I discovered the 1904 New York City catalogue in the Archives of the Arnold Arboretum in 1988 (Del Tredici, 1989). This catalogue had been posthumously donated to the Arnold Arboretum in 1958 by Dr. Ernest G. Stillman, a graduate of Harvard College (class of 1907) and a well-known benefactor of that institution.

The Boston and London auctions were sponsored by Yamanaka & Company of

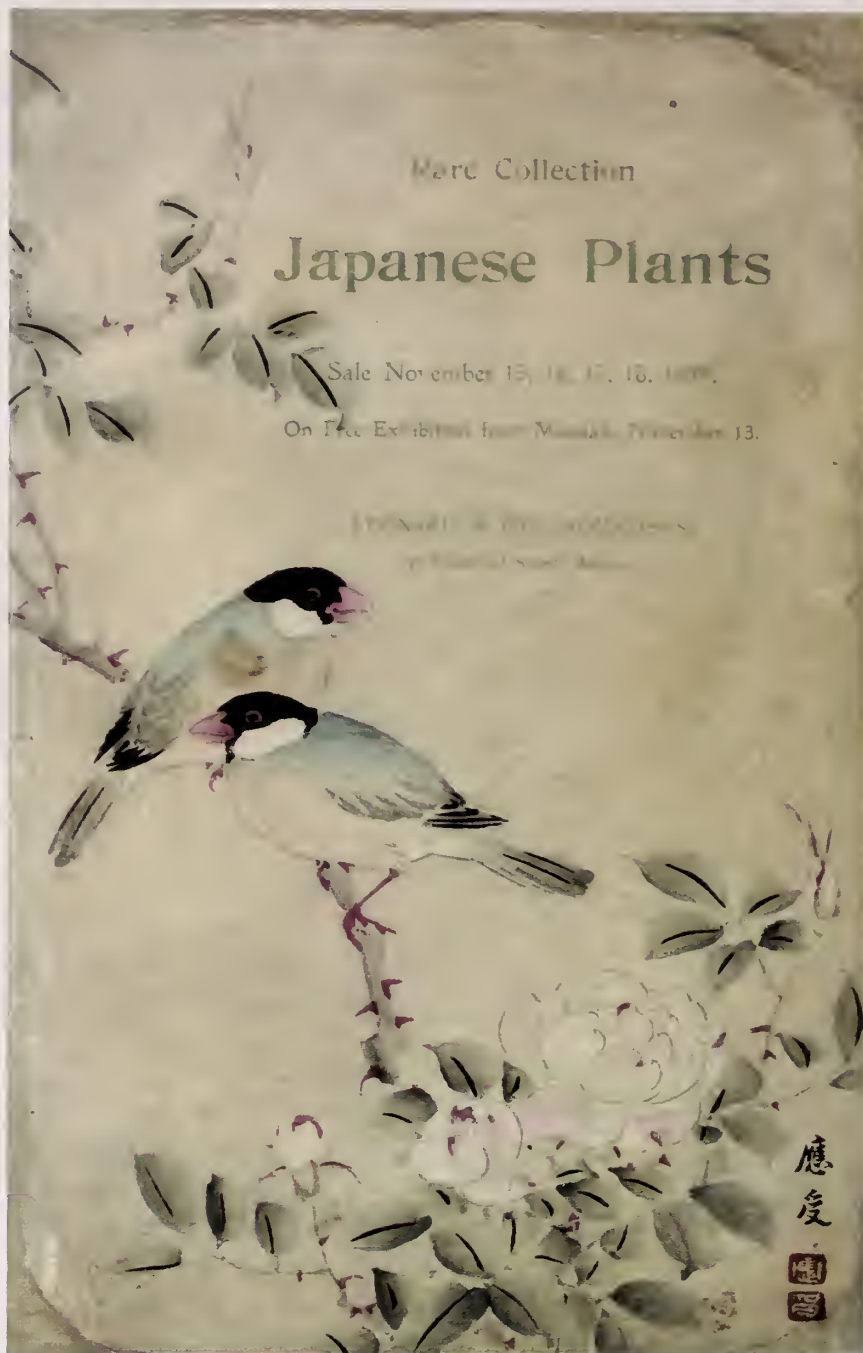


Figure 12. The front cover of the November 15-18, 1899 auction catalogue, sponsored by Yamanaka & Co. in Boston.



S. M. JAPANESE NURSERY

Figure 13. *The staff of the S. M. Japanese Nursery Company, from the 1904 New York auction catalogue.*

Osaka, Japan, while the New York auction was sponsored by the S. M. Japanese Nursery Company of West Orange, New Jersey (Figure 13). All the catalogues are profusely illustrated with black and white photographs of the plants and other miscellaneous art objects, and the Boston and New York catalogues have beautiful color covers, the later featuring a woodblock print of a woman watering *bonsai* plants by the famous artist Mizuno Toshikata (Figure 14).

While many different types of "arboreal plants, curiously and artistically trained" were offered for sale in the auctions, 'Chabo-hibas' were the most common specimens offered for sale in two of the three early auctions. Indeed, 321 (25%) of the 1310 total items offered for sale in the three auctions combined were 'Chabo-hiba'. Statistically speaking,

the average 'Chabo-hiba' offered for sale was roughly 60 years old and 48 centimeters tall; it was most likely green in color (but it could also be golden or white-variegated), with a conical shape, and was growing in a blue and white pot. A complete summary of all the plants offered for sale in the three auction catalogues is presented in Table 1.

Interestingly, only one hundred and thirty-nine of the items offered for sale in the three auctions were specifically labeled as "Bon Sai," a term that the glossary of the 1904 New York catalogue describes as: "Interpreted means a large tree of the forest that the tree trainer has taken as a model and trained in miniature to show every detail, even to the number of branches and shape of trunk, etc., that the large tree possesses, literally meaning a 'tree on a





Figure 14. Front cover of the catalogue for the auction sponsored by the S. M. Japanese Nursery Company of West Orange, New Jersey on May 4-6, 1904 in New York City. This woodblock print is by Mizuno Toshikata, and is very similar to his March 1, 1899 print “#6 Woman watering bonsai,” from his “Contemporary Beauties” series.

	Boston 1899	London 1900	New York 1904	Grand Totals
Total number of Auction items	450	300	560	1310
'Chabo-hiba' plants	112	74	135	321 (25%)
'Chabo-hiba' variety: green	88	67	123	278 (87%)
'Chabo-hiba' variety: gold	20	7	9	36 (11%)
'Chabo-hiba' variety: variegated	4	0	3	7 (2%)
'Chabo-hiba' < 50 years	74	21	71	166 (54%)
'Chabo-hiba' > 50 < 100 years	34	33	37	104 (34%)
'Chabo-hiba' > 100 years	4	18	15	37 (12%)
Average age of 'Chabo-hiba' (years)	48.2 yr (n = 112) range: 10 to 285	77.9 yr (n = 72) range: 18 to 300	58.8 yr (n = 123) range: 14 to 300	59.5 yr (n = 307)
Average height of 'Chabo-hiba' (in.)	20.7" (n = 112) range: 5" to 54"	18.6" (n = 72) range: 5" to 36"	17.4" (n = 126) range: 9" to 43"	18.8" (n = 310)
'Chabo-hiba' shape: jikka (or jikkei)	27	17	32	76 (50%)
'Chabo-hiba' shape: mikoshi	20	12	1	33 (22%)
'Chabo-hiba' shape: kengai	14	7	2	23 (15%)
'Chabo-hiba' shape: nakasu	12	8	0	20 (13%)
<b>Other Plants in the Auction Catalogues</b>				
<i>Pinus parviflora</i>	82	81	28	191 (15%)
<i>Podocarpus</i> species	49	10	9	68 (5%)
<i>Acer</i> species	5	0	59	64 (5%)
<i>Cycas revoluta</i>	43	12	2	57 (4%)
<i>Larix kaempferi</i>	0	0	38	38 (3%)
<i>Juniperus chinensis</i>	10	2	20	32 (2%)
"Bon Sai"	31	59	49	139 (11%)

Table 1. A statistical summary of the characteristics of the 'Chabo-hibas' and other dwarfed trees offered for sale in the Boston (1899), London (1900), and New York (1904) Auction Catalogues.



tray." Most of the New York catalogue items that are listed as "Bon Sai" are described as consisting of several small plants grouped together to form a "charming landscape." In contrast the older, solitary specimens are listed according to species and are categorized as having one of four basic shapes, which the glossary defines this way:

"Jikka" is a shape of tree having a regular and proportional arrangement of the branches, giving a conical shape to the tree. This tree is always planted in the centre or important position of the gardens.

"Mikoshi" is a shape of tree having generally no branches at the bottom, as this plant is always placed behind something, and only the top branches show; the literal meaning of "Mikoshi" being "to look over."

"Kengai"—A shape to represent a tree overhanging a cliff.

"Nakasu"—A shape of a tree growing on an island and having its branches overhanging the water.

In 1902, the French horticulturist, Albert Maumené published a detailed study of the techniques used by the Japanese to produce dwarfed trees as well as the aesthetic principles that regulated their design. Based his experience with plants that had been imported into Europe for display at expositions or for sale at auctions, Maumené described the practical procedures used to keep the plants healthy and to maintain their original shapes. In his book, Maumené followed the same system for classifying the styles of dwarfed trees that was presented in the 1900 London auction catalogue, suggesting that it was his primary source of information.

The abundance of 'Chabo-hibas' in the auction catalogues, and the great age of some of the specimens (up to 300 years old) clearly suggest that the plants had lost favor in Japan in the late 1800s and were being "dumped" on the newly opened western markets. Hard evidence for this supposition comes from the statements of Kamajiro Yamada (1995) who, in an article written in 1977, described his experiences with 'Chabo-hiba' while working in his father's nursery:



No. 422.

Figure 15. Item #422 from the 1899 Boston auction catalogue with the following description: "Chabo Hiba. Green variety; another style of the Jikkei shape, trained by the late Mr. Takagi, one of the best known cedar trainers; we wish to call attention to the fact that this specimen is a perfectly natural growth, in that it has never been cut to reduce its size, but has simply been kept back to its present height by the most skillful and careful training; a marvelous example when one considers this triumph of art; height, 2 feet, 6 inches; age about 90 years; Shigaraki pot. See illustration."

When I was still a child (at the end of the Meiji Period, 1867-1911) my father and many other grew numerous specimens of 'Chabo Hiba' hinoki cypress, *Chamaecyparis obtusa* 'Chabo Hiba.' They propagated them by grafting and always used common hinoki cypress for understock. Each year we propagated two to three thousand hinoki cypresses from cutting to be used for grafting understock. The 'Chabo Hiba' hinoki cypress we produced were not popular in Japan for bonsai; we grew them for export to the United States, China, and Europe. We trained them so they had undulating trunks with many curves and a triangular crown shaped like the top of Mt. Fuji... At that time, people skilled in bonsai always had a hinoki cypress bonsai, but nowadays you do not see many of them. That is due to the fact that the care for hinoki cypress is rather laborious and people do not know the proper methods for caring for them.

Information in the auction catalogues clearly supports Yamada's recollection that 'Chabo-hiba' was typically trained to have the shape of Mt. Fuji. Indeed, of the 152 plants listed as having a specific shape, exactly half of them had the *jikka* or mountain shape. Those 'Chabo-hiba' specimens that did not fit any of the four primary shape categories are described as having shapes that were evocative of everyday objects such as a butterfly, a pair of eye glasses, a pagoda, a hellfish, a waterfall, a magnifying glass, or even the "long flowing sleeves of an ancient court lady."

From the historical perspective, most of the specimens described in the auction catalogues should be properly considered *hachi-no-ki* ("potted tree") rather than *bonsai*. The use of the term *hachi-no-ki* in Japan dates back at least to the 1400s and describes dwarfed trees with a variety of shapes growing in relatively deep containers. The word *bonsai*, which is equally ancient, was originally used as a synonym for the term *hachi-ue* ("potted plants"), but did not achieve linguistic dominance until the late-1800s when its meaning took on artistic connotations. In general, *bonsai* takes its inspiration from nature and utilizes shallow pots or trays, while *hachi-no-ki* is more stylized and uses deeper pots (Matsuki, 1931; Yoshimura, 1991a & b; Marushima, 2005).

### The Lineage of 'Chabo-hibas' sold at Auction

The most fascinating aspect of the auction catalogues is their careful documentation of the horticultural lineages of many of the older specimens which were produced by famous master gardeners who worked at important temples. Among the 'Chabo-hiba' trainers mentioned by name, Mr. Kiyey Takagi of Tokyo stands out as the only person listed in all three catalogues, with a total of 17 plants credited to him. Item #422 from the 1899 Boston catalogue is one of his more spectacular productions (Figure 15). The second most common trainer in the catalogues is a Mr. Genbei of Tokyo with 8 plants to his credit, including the outstanding item #450 from the Boston auction (Figure 16).

Other noteworthy catalogue items included specimen #336 from the 1904 New York auction, which was created by three successive

generations of trainers in one family (Figure 17); and item #340, also from New York, that came from the famous Hongauji temple in Kyoto, where it was admired by close to a million people (Figure 18). One final plant that deserves special mention is item #270 from the 1900 London auction, which had made a big splash in Boston earlier in the year:

**Chabo Hiba;** green variety. A splendid specimen of Nagashi shape; trained by Genbei of Tokio. The wonderfully gigantic trunk and peculiar training of branches merit attention. Secured from Mr. Hamada's garden two years ago. This plant was exhibited at the Horticultural Show in Boston, and first prize awarded on this particu-



Figure 16. Item #450 from the 1899 Boston auction catalogue with the following description: "Chabo Hiba. Green variety; this remarkable tree was trained by the great cedar trainer, Genbei of Tokio; this family have had for more than 300 years the special honor of being gardeners to the different Lords Kaga, and they own at present the finest gardens in Tokio; this cedar was secured from these gardens, where it had been carefully trained for over 120 years; a more magnificent specimen of the Mikoshi shape would be difficult to find in Japan, and cannot be duplicated in the United States; without exception the finest specimen ever brought to this country; height, 4 feet, 6 in.; width, 5 feet, 6 inches; age 270 to 300 years; Shigaraki jardiniere."



lar Chabo Hiba. Circumference of the trunk, 15 inches; height 35 inches; age, about 300 years. Beautiful blue and white pot.

A check of the *Transactions of the Massachusetts Horticultural Society* for the year 1900 confirmed the fact that Yamanaka & Co. was awarded Honorable Mention for its "Display of Japanese Plants" at the annual Spring Exhibition, held from March 20 through 23, 1900 (Lunt, 1901). So here was a plant that traveled three-quarters of the way around the globe—



336

Figure 17. Item #336 from the 1904 New York auction catalogue with the following description: "Chabo-hiba (*Thuja Obtusa Nanus*). One of the most wonderful specimens in this collection. The arrangement of the branches and the fine growth of leaves, in spite of its age, has been admired by art loving people in Japan. It has been exhibited at many horticultural exhibitions and many medals were awarded to this specimen. It was trained by Kinhachi of Tokio in the famous Denchu garden, located at Sugamo, an outskirts of Tokio, and succeeded by his son Kinbei, and finally by his grandson Kingoro of the present time. A very valuable specimen. Height 2 feet, 10 inches. 125 years old. With beautiful Awaji pot and Kagomaki decoration."



340

Figure 18. Item #340 from the 1904 New York auction catalogue with the following description: "Chabo-hiba. One of the most imposing-looking specimens in this collection. This grand tree once belonged to the famous temple Hongauji, Kyoto, the ancient Capitol of the Japanese Empire. It has been said that owing to its most attractive shape, this specimen was admired by almost a million people, who made the pilgrimage to this noted temple of Buddha. It was trained by several master gardeners who gave their services to the temple. Trained in the standard Jikka style. Note: its most graceful branches extend into both sides. About 100 years old; height, 2 feet, 6 inches. With Chinese pottery pot on stand."

from Japan to Boston to London—in space of a single year, and lived to tell the tale!

The spectacular appearance and colorful history of these ancient 'Chabo-hiba' specimens raises the question of why the Japanese seemed to be so willing to part with them. Was it for the money? Was it changing fashion? Or had the plants simply become too big and too much trouble to take care of, as suggested by Yamada? The answer, undoubtedly, is some combination of all of the above reasons. Regardless of the rationale behind the decision to get rid of the plants, it's sad to think about these noble specimens being auctioned off to private western collectors who had no idea how to care for them.

## WHO WAS LARZ ANDERSON?

At the other end of the Japanese dwarfed tree supply chain were the wealthy European and American collectors who collected everything the Japanese were willing to sell. In regards to horticultural "antiques," Larz Anderson and his wife Isabel might serve as a model for the typical western customer. Larz was born in Paris in 1866, and grew up in Cincinnati, Ohio, a city founded by his grandfather, Nicholas Longworth, who had become a millionaire in the early nineteenth century. The Andersons traveled to Europe frequently and eventually settled in Washington, D.C. As a boy, Larz was tutored privately and attended a number of different schools, including Phillips Exeter Academy. Following in his father's footsteps, Anderson enrolled in Harvard College and graduated with an A.B. degree in June 1888. Two months later, he set out on a trip around the world. The journey lasted two years and included a memorable visit to Japan (Kenworthy, 1991).

Larz served in the military as Captain and an Assistant Adjutant General during the Spanish-American War. After this experience, he joined the Foreign Service as a diplomat in England and Italy, and as Minister to Belgium. Anderson rose quickly to the rank of ambassador and in 1912 he returned to Japan as "Ambassador extraordinary and plenipotentiary." He held this post for only six months, resigning in March 1913, with the change from the Republican Taft administration to the Democratic Wilson administration. This was the last official diplomatic position that Anderson held.

Larz married Isabel Weld Perkins of Brookline, Massachusetts, in June of 1897. Isabel, who was born in 1876, came from a wealthy, aristocratic New England family. While still a young woman, she inherited the then fabulous sum of \$17 million derived from a variety of family enterprises, most notably the clipper ship company operated by her grandfather, William Fletcher Weld. She attended college rather late in life, earning a Doctor of Letters (Litt. D.) degree from George Washington University in 1918 and her Doctor of Law (LL.D.) degree from Boston University in 1930. She



AMBASSADOR AND MRS. LARZ ANDERSON  
Portrait by PHILIP DE LASZLO

Figure 19. *Ambassador and Mrs. Larz Anderson. Portrait by Philip de Laszlo. From Larz Anderson, Letters and Journals of a Diplomat, edited by Isabel Anderson, 1940.*

was a prolific writer, producing seventeen books between 1909 and 1933, as well as two plays and a volume of poetry.

As newlyweds, Isabel and Larz purchased a residence—including a huge stable and substantial land—in Brookline from one of Isabel's cousins. They called their new home "Weld," which served as their summer house from late spring through fall. As befits a diplomatic couple, the Andersons made Washington, D.C., their primary home. Isabel loved traveling the world as much as her diplomat husband did and, over the course of her life, wrote no less than thirteen travelogues about her experiences (Figure 19) (Kenworthy, 1991).



The part of Brookline where "Weld" was located, in the vicinity of Jamaica Pond, was one of the centers of American horticultural activity from the early 1800's up until the late 1920's. The estates of Col. William Perkins, Thomas Lee, Charles Sprague Sargent, and Francis Parkman, the historian, were showpieces of their time. Later Olmsted acquired property in the area, and the Arnold Arboretum was established nearby in 1872. In the now classic 1841 edition of *The Theory and Practice of Landscape Gardening*, Andrew Jackson Downing described the area this way:

The whole of this neighborhood of Brookline is a kind of landscape garden, and there is nothing in America of the sort, so inexpressibly charming as the lanes which lead from one cottage, or villa, to another. Nor animals are allowed to run at large, and the open gates, with tempting vistas and glimpses under the pendent boughs, give it quite an Arcadian air of rural freedom and enjoyment. These lanes are clothed with a profusion of trees and wild shrubbery, often almost to the carriage tracks, and curve and wind about, in a manner quite bewildering to the stranger who attempts to thread them alone; and there are more hints here for the lover of the picturesque in lanes than we ever saw assembled together in so small a compass.

"Weld" was famous in horticultural circles well before the Andersons went to Japan in 1912. The terraced Italian garden was designed in a lavish, formal European style by Charles A. Platt in 1901. It was featured in several magazines of the day, including *Town and Country* (Anonymous, 1904), *Country Life in America* (Miller, 1905), and *House and*



THE BOSQUET AT THE END OF THE GARDEN, THE PERGOLA, FLOWER DRAPED, MARBLE BALUSTRADE, THE WALL FOUNTAIN AND THE GREAT LUDOVISI JARS

Figure 20. "The bosquet at the end of the garden, the pergola, flower draped, the marble balustrade, the wall fountain and the great Ludovisi jars." Note the parrot in the center of the picture. Illustration from the March 12, 1904 issue of *Town and Country*.



THE END OF THE GARDEN, SHOWING THE WALL FOUNTAIN AND VASES

Figure 21. "The end of the [Italian] garden, showing the wall fountain and vases." Illustration from the March 12, 1904 issue of *Town and Country*.



Looking down over the Larz Anderson garden, which was designed and made by a gardener from Japan

Figure 22. *The Japanese Garden at "Weld" constructed in 1907. Photograph by T. E. Marr from Isabel Anderson's 1909 House and Garden article.*



Figure 23. *A view of the Japanese Garden at "Weld." Photograph in 1908 by T. E. Marr, courtesy of the Museum of Transportation, Brookline, MA.*





Figure 24. 'Chabo-hiba' specimens on the terrace of the Anderson's home at "Weld." Top, c. 1916, courtesy of the Museum of Transportation, Brookline, MA; bottom, from *House Beautiful*, June, 1933.

*Garden* (E. T., 1904). This last article waxes poetically about the glories of the garden as a true work of art:

Not the work of many hands is this, nor the result of piecemeal additions nor the accidents of changing Time. The long probation which gardening as an art has served appears not to have entered here. "Weld" is a deliberate creation, rather than an outgrowth; a consummate work started and finished, as it were, in a day. All difficulties of the work have disappeared, nor can they longer be imagined to have halted the hand of the artist who here, apparently unhindered

and unvexed with the toil and moil of execution, put all parts into place with the seeming ease of a child who turns his kaleidoscope at play. (Figures 20 and 21)

Larz and Isabel added a Japanese garden to "Weld" in 1907, with stepping stones, a large stone bridge, a variety of Japanese lanterns and statuary, and a collection of tightly trimmed conifers (Figures 22 and 23). The garden was laid out by the Anderson's personal Japanese gardener, simply referred to as "Onchi San," and was featured in an article that Isabel wrote for *House and Garden* in 1909. She described the garden this way:

A little corner near a Massachusetts country house has been made into a most bewitching spot. When you enter the thatched gateway you forget New England—you are in Japan. You see Onchi San, dressed in his native costume, standing by the birds' bath-tub, watching the pretty feathery creatures as they splash in the hollow stone filled with rain-water. Presently he steps inside the wicker enclosure and washed too, for he has been weeding the garden which he has designed and made with his queer little upside-down tools...

Here and there among the greens are bright-colored bowls with grotesque designs, and gray stone lanterns. Above you rises the huge bronze eagle; he is the one high point, the key of the Japanese garden. His piercing

eye looks down to frighten you, but, reflected in the smooth surface of a pool near by, sits the calm and smiling Buddha to dispel the fear, and so peace and happiness pervade this little fragment of the far East. It is only when your eye suddenly catches sight of the big elm hanging over all that you realize that you are at home.

### An Infatuation with Japan

Larz Anderson's interest in Japanese horticulture dates back to at least 1889, when, at the age of 23, he returned home from his trip around the world with two dwarfed maples that he had

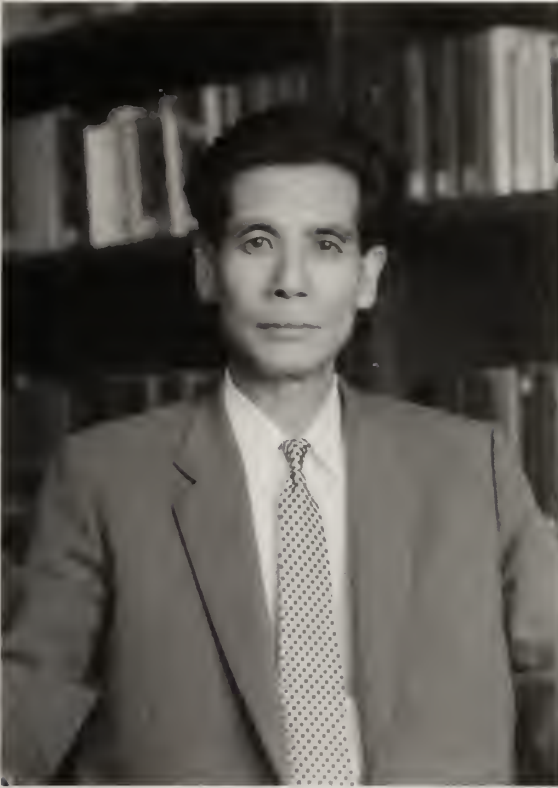


Figure 25. Rainosuke Yori Awano in 1950. Photograph courtesy of Ohio Wesleyan University.

purchased in Japan. But it was not until 1913 that this interest fully matured. His journal entry for February 1, 1913, shows the moment of enchantment:

About us were dwarf trees of fantastic shape and stunted plum in fragrant bloom, white and pink, and gnarled trees hundreds of years old with branches blossoming out of seemingly dead trunks in pots of beautiful form and color. Isabel and I stopped so long in this little fairy place that we had to drive like the dickens through the congested streets of endless villages to Yokohama, which we reached without disaster in a little over an hour, in time for one o'clock luncheon. (Anderson, 1937)

Anderson must have purchased at least forty dwarfed trees from the Yokohama Nursery Company shortly after this experience, since he returned to the United States a little more than a month later, on March 6 (Anderson, 1937) (Figure 24). Exactly how much Larz Anderson paid for his plants is not recorded, but the 1913–14 edition of the Yokohama Nurs-

ery catalogue lists the “dwarfed trees we have always on hand to select from ranging in price from \$1 to \$50 [in U.S. gold], depending on age, size, etc.” (see inside front and back covers). A survey of the catalogues revealed that the prices remained remarkably stable at \$1 to \$50 from 1901 through 1924. From 1919 on, however, the mode of payment shifted from gold dollars to gold yen. Multiplying this figure by twenty, to make the price roughly comparable to today's dollars, would make the cost roughly \$20 to \$1,000.

Living plants were typically shipped by boat from Yokohama to North America during their dormant period, from October through February. Around the turn of the century, the boat trip to San Francisco took 18 to 20 days, while the trip to New York City via the Suez Canal took 70 to 80 days. It was common practice to deliver the plants to San Francisco and then transship them to the east coast via railroad, which took about 28 days, for a total delivery time of 46 to 48 days when shipped east from Japan to New York (Elias, 2005). The Connecticut nurseryman, Ernest F. Coc purchased some dwarfed trees from Japan in 1911, and described an experience that was probably typical for the time: “Their journey over land and sea covered three months, but so skilfully [sic] had they been packed that they appeared but little the worse for their long subjection ‘in durance vile.’”

The purchase of plants from the Yokohama Nursery represented a serious escalation of Anderson's commitment to Japanese horticulture. Not only were the plants expensive to import but, once in the United States, they had to be maintained by someone knowledgeable in the techniques of dwarfing trees. Undoubtedly the task would have been assigned to Onchi San, and later to other members of the gardening staff. In 1932, the Andersons hired a Japanese scholar by the name of Rainosuke Yori Awano to take care of the plants. Awano had earned an A. B. degree from Ohio Wesleyan in 1927 and a M. A. degree from Columbia University in Hellenic studies in 1930. He had met the Andersons in 1932 while studying Greek antiquities at Harvard, and worked for them as both a gardener and the caretaker of their Asian collections until 1938 (Figure 25). He worked





Figure 26. Larz Anderson's display at the 1933 New England Spring Flower Show. Note that the small plant in the background on the right has a label that reads, "Gift from Imperial House of Japan—60 years old." This is the only known photograph of the 'Chabo-hiba' specimen which had been given to the Andersons by the Emperor of Japan. From the Archives of the Arnold Arboretum.

for the Boston Museum of Fine Arts as an Assistant Librarian from 1938 through 1940, when he returned to Japan to join the staff of Kobejogakuin College with a specialization in ancient Greek papyrology. In 1950, he was appointed professor of history at the University of Kanseigakuin (Anonymous, 1951; Kenworthy, 1991).

On at least two occasions, Larz Anderson put his collection of dwarfed trees on public display: at the 1916 spring flower show of the Massachusetts Horticultural Society (May 12–14), where it was awarded first prize and a silver medal; and again from November 23 to 26, 1933 at the M.H.S. show of chrysanthemums and Japanese dwarfed trees, were the exhibit—which was sponsored by the Japan Society of Boston—was awarded a gold medal. The display featured a straw shelter with a background of gold screens (Figure 26).

Also in 1933, a popular article about the Larz Anderson Collection appeared in the June edition of *House Beautiful*, which contained a number of photographs of the plants along with an interview with Awano (Guthrie, 1933). The author had no problem anthropomorphizing her subject matter:

It seems unholy to move such venerable patriarchs from the land where they have lived so long in meditation and repose. But they are here, nevertheless, in this country which was a wilderness when they and their art had reached a high degree of elegance and culture. And on the wide green terrace before the stately Brookline home of Mr. Larz Anderson, noted statesman and scholar, these noble trees, samurai of their realm, seem quite at home. That may be because adaptability is a quality of the nobly born (see Figure 24, bottom).

The author goes on to quote Awano regarding his approach to training the trees:

"There are two ways for the tree to grow—vertically and horizontally. The tree will want to grow vertically, reaching up to heaven, drawn by the sun, but that way it will grow too fast, for it wants to reach heaven soon. So we must make it grow horizontally and then it will grow slowly. So we trim the top branches and train it to grow horizontally." From then on it is a matter of thin wires and tiny bamboo sticks to flatten out the branches and keep them disciplined. There must be three branches, or five or seven, he told me—never more than seven.



Figure 27. The Italian garden at "Weld" was transformed into an ice hockey rink by the Town of Brookline in 1958. Compare with Figure 21. Photographed in 2004 by Peter Del Tredici



Figure 28. The remains of the Japanese garden at "Weld" with the Boston skyline in the distance. Photographed in 2004 by Peter Tredici.



### The End of an Era

Larz Anderson died in April, 1937, and six months later Isabel donated the major portion of his dwarfed tree collection—thirty plants in all—to the Arnold Arboretum, along with the funds necessary to build a shade house for their display. Isabel died eleven years later, in November of 1948, and in July of the following year the remaining nine plants in the collection were donated to the Arboretum, including one that the Andersons considered their most special possession, a seventy-six-year-old 'Chabo-hiba' that had been given to them as a gift from "the Imperial House of Japan" (AA #885-49). According to Guthrie, "Mr. Anderson, himself, carefully supervised the journey of this precious tree" across the Pacific in 1913. The only known image of this plant is on the right side of the photograph of Anderson's 1933 exhibit at the Massachusetts Horticultural Society (see Figure 26). The fact that Isabel held onto nine plants after Larz's death clearly indicates that she had become as attached to the collection as her husband had been.

Following Isabel's death in 1948, "Weld" was donated to the Town of Brookline to become part of its park system. Today it is called Larz Anderson Park, and its stables now house the *Museum of Transportation*, which was founded in 1949 with the Anderson's antique car collection forming its core. Very little remains of the once glorious Italian garden, with its marble balustrade, wall fountains, and geometric planting beds, which was destroyed by the Town of Brookline in the 1950s to make room for an ice-hockey rink (Figure 27). As for the Japanese garden, it survives only as an



Figure 28. The golden eagle that formerly dominated the Anderson's Japanese garden, now dominates the campus of Boston College. Compare with Figure 22. Photograph by Peter Del Tredici.

echo of its former self, marked by the presence of some granite steps, a slate bridge, four Sawara Cypresses (*Chamaecyparis pisifera*), a large Japanese maple (*Acer palmatum* 'Yatsubusa'), and three spreading Japanese yews (*Taxus cuspidata* 'Nana') (Figure 28). The bronze eagle that once dominated the Japanese garden has been relocated to the campus of Boston College in Chestnut Hill, where it now oversees campus life as the college mascot (Figure 29).

## LARZ ANDERSON COLLECTION AT THE ARNOLD ARBORETUM

When Isabel donated Larz's dwarfed plant collection to the Arnold Arboretum, she also donated the funds necessary to build a lath house to display and protect them. This structure was situated on the grounds of the old Bussey Institution that was formerly located on the southeastern boundary of the Arboretum and is now occupied by University of Massachusetts Medical Laboratories (Figure 30) (Wyman, 1938). Unfortunately the Larz Anderson Collection did not continue to get the attention of knowledgeable Japanese gardeners following its donation to the Arboretum. The staff did the best it could with its limited knowledge of how to maintain the plants and its limited financial resources during the Depression/World War II era.

In the 1950's and early 60's, additional stress was put on the collection by the practice of forcing some of the plants into growth for the spring flower show of the Massachusetts Horticultural Society (1954 and 1959) as well as for other shows in the region (most notably the Detroit flower show in 1961). While this made for a spectacular display, it seriously weakened the collection and contributed to its overall decline. As a result of these factors, the collection shrank from the original thirty-nine plants to twenty-seven in 1962. Included among the casualties was the 'Chabo-hiba' that had been the Japanese emperor's gift to the Andersons.

Things began looking up for the collection in 1962, when work on the Charles Stratton Dana Greenhouses of the Arnold Arboretum was completed (Wyman, 1964). This new horticultural facility included an attractive hexagonal redwood lath house for displaying the collection during the growing season and a concrete-block cold-storage unit for winter protection. The construction of this building, which maintains temperatures between 1 and 3 degrees Centigrade (34 and 38 degrees Fahrenheit), brought an end to the practice of storing

the plants in covered pits and cold frames for the winter. Not only was this dangerous to the health of the plants, but the consequent freezing of the root ball also cracked some of the original Japanese containers.

Another positive turn of events for the collection occurred in 1969 when Connie Derdarian of Watertown, Massachusetts, was made Honorary Curator. Connie had been teaching courses in *bonsai* at the Arboretum for several



Figure 30. The Larz Anderson collection in the old lath house at the Bussey Institution, May 1938. Photograph by D. Wyman, from the Archives of the Arnold Arboretum.

years prior to her appointment, and was well known to the greenhouse staff. Her own words describe how she became involved with the plants:

Perhaps because I was the only Bostonian who, for almost ten years, had steadily pursued the study of *bonsai* in the United States and in Japan, in 1969, through the efforts of Mr. Alfred Fordham, Dr. Donald Wyman asked me to repot the Anderson collection of *bonsai*. I did and began a program to renew the vigor and beauty of these venerable trees. Dr. Richard A. Howard, director, pleased with the initial effort, had me appointed Honorary Curator of the *Bonsai* Collection.

Working patiently and with a clear sense of purpose, Connie began the long process of revitalizing the collection after years of neglect.





Figure 31. Connie Derderian working on one of the Larz Anderson 'Chabo-hibas' in 1970. From the Archives of the Arnold Arboretum.



Figure 32. The hexagonal home of the Larz Anderson Collection at the Arnold Arboretum. Photographed in 1987 by Peter Del Tredici.

She continued as curator until 1984, when her failing health forced her to resign her position (Figure 31). Having worked as Connie's apprentice since 1979, I became the new curator the year she resigned. During the spring of 1987 the deteriorating redwood slats on the hexagonal lath house were replaced with more structurally substantial vertical-grain Douglas fir, and a new security system was installed. In June, the newly renovated structure was dedicated to Connie (Figure 32). She died a year later, on September 20, 1988. A highlight of Connie's

tenure as curator came in the fall of 1982, when three plants from the Larz Anderson Collection were put on display at the Boston Museum of Fine Arts to celebrate the opening of its newly renovated Asian wing.

Two of the large 'Chabo-hibas' were displayed at the New England Spring Flower show in 1987 and again in 1997, when they were also featured in an article in *Horticulture Magazine* by Public Television's "Victory Garden" host, Roger Swain. In 1998, the noted English *bonsai* expert, Colin Lewis, became involved with the Larz Anderson collection, initially as a volunteer and later as a paid consultant. Since that time, Colin and I have worked closely together to reestablish the traditional form and character of the 'Chabo-hibas', as documented in the Japanese auction and nursery catalogues. This work came to fruition in March, 2006 with their display at the New England Spring Flower Show (Figure 33).

As of this writing, fifteen plants still remain of the original thirty-nine plants in the Larz Anderson Collection. These include seven *Chamaecyparis obtusa* 'Chabo-hiba,' four Japanese Maples (*Acer palmatum*), one Trident Maple (*Acer buergerianum*), one Higan Cherry (*Prunus subhirtella*), one Japanese White Pine (*Pinus parviflora*), and one Sawara Cypress (*Chamaecyparis pisifera* 'Squarrosa') (Table 2).

The 'Chabo-hiba' specimens that make up the core of the Larz Anderson Collection are clearly of the same vintage as those described so vividly in the early auction catalogues. They started out life in the 1700s as venerated temple decorations throughout Japan, and then, starting in the late 1880s, were summarily shipped off by the boat load to a variety of western countries through the early 1920s, when their importation into the United States dropped off due to the enforcement of new plant quarantine laws that had been enacted to prevent the accidental introduction of plant diseases and harmful insects (Creech, 2001). The fact that seven of Larz Anderson's original ten 'Chabo-hiba' trees are still alive, ninety-three years after leaving their homeland, is nothing short of miraculous; especially when you consider that all their peers are mostly dead and their once lofty status in Japan all but forgotten.

## NOMENCLATURAL CONCLUSIONS

The hinoki cypress cultivar name 'Chabo-hiba' is not widely grown in Japan today, and it took some effort to uncover its precise meaning. *Hiba* is the common name for the arborvitae-like conifer that is endemic to Japan, *Thujopsis dolobrata*. The word literally means "hatchet-shaped" and refers to the scale-like foliage of the plant. The word *chabo* means bantam or dwarf chicken, and when combined with *hiba* is translated to mean "compact or dwarf cypress."

The earliest use of the name 'Chabo-hiba' that I have been able to find is from the three-volume book *Somoku Kihin Kagami*, published origi-

nally in 1827 and reprinted in 1976 with modern Japanese characters and Latin plant names (Kintaro, 1827; Tsukamoto, 1976). This work covers hundreds of plants considered highly unusual or rare at the time. While 'Chabo-hiba' itself is not covered in the book, a *Chamaecyparis* cultivar listed as *Chabo-yadori*, meaning "bantam's nest" is described. The accompanying illustration shows a plant with two types of foliate, the loose, feathery growth ("Cryptomeria-like") rising out of a "nest" of tight congested growth ("Chabo-hiba-like"). In the text, the author states that he first noticed the plant as an unusual branch (or sport) on a specimen

Accession #	Scientific Name	Common Name	Age <sup>1</sup>
870-37	<i>Acer buergerianum</i>	Trident Maple	1852
872-37	<i>Acer palmatum</i>	Japanese Maple	1887
877-37	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1737
878-37	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1787
879-37	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1802
880-37	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1832
881-37	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1862
889-37	<i>Prunus subhirtella</i>	Higan Cherry	1852
899-37 <sup>2</sup>	<i>Chamaecyparis pisifera</i> 'Squarrosa'	Sawara Moss Cypress	1907
886-49	<i>Acer palmatum</i>	Japanese Maple	1887
888-49	<i>Acer palmatum</i>	Japanese Maple	1897
889-49	<i>Acer palmatum</i>	Japanese Maple	1897
890-49	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1832
892-49	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1787
893-49	<i>Pinus parviflora</i>	Japanese White Pine	1887
101-69 <sup>3</sup>	<i>Chamaecyparis obtusa</i> 'Chabo-hiba'	'Chabo-hiba' Hinoki Cypress	1969

<sup>1</sup> Ages from Anderson, 1937

<sup>2</sup> This plant was originally part of a miniature planting that also included one *Cryptomeria japonica* and one *Euonymus fortunei radicans*.

<sup>3</sup> This plant was created by separating off a lower branch of from #879-37

Table 2. Inventory of the Larz Anderson Collection of Japanese Dwarf Trees as of January, 2006.





Figure 33. A portion of the Larz Anderson Collection on display at the 2006 New England Spring Flower Show from March 10–19. Photograph by Peter Del Tredici.

of 'Chabo-hiba', and propagated it specially. As this reference in *Somoku Kihin Kagami* indicates, the name 'Chabo-hiba' has a long tradition of use in Japan that predates any naming of the plant by western botanists. This reference also indicates that 'Chabo-hiba' is a rather unstable stable selection that has given rise to a number of bud-sport mutations—namely the gold and white-variegated varieties—over the course of its cultivation.

The fact that 'Chabo-hiba' was a well established name in Japan did not stop European botanists from trying to change it. *Nana* is the oldest Latinized name that possibly describes 'Chabo-hiba'. It was published by Elie-Abel Carrière in 1867 as: "much smaller than the species, this rarity is distinguished mostly by its branches, branchlets and twigs which are very slender and very short." George Gordon, in his famous book, *The Pinetum* published in 1875, defined the variety *compacta* as: "The leaves and branches of this variety resemble those of the species in every way, except that they are much smaller, and the plant has a very dense and compact habit." In the same book, Gordon published the name *pygmaea*, which might also have described 'Chabo-hiba':

"This very singular variety forms a dwarf, cushion-shaped, little bush, which seldom grows more than a foot or two high, but spreads out in a horizontal direction all round, more than double that

distance, and forms a large, dense, flat tuft of glossy-green spray when old, with branchlets and leaves exactly like those of the species. A very curious miniature evergreen bush, much cultivated in the Japanese gardens about Yeddo. On account of its very dwarf habit, dense, compact appearance, and glossy deep green colour. It is quite hardy, and forms an interesting object for rock-work or miniature gardens."

A fourth Latinized name, *breviramea*, was used by Carrière to describe the 'Chabo-hiba' specimens he observed at "L'Exposition Universelle" in Paris in 1889. This name had originally been published by Maximowicz in 1866 to describe a supposedly new species of *Chamaecyparis* from southern Japan, but later authors reduced it to synonymy with *C. obtusa*, rendering its use obsolete.

Despite the fact that all of these various names can be interpreted as more or less accurate descriptions of 'Chabo-hiba', they suffer from the same drawback that affects all Latinized botanical names for horticultural cultivars: they were originally intended to describe groups of plants that share similar characteristics rather than distinct, clonally propagated individuals. The lack of precision of these older Latinized names, in conjunction with their obvious lack of priority, provides ample justification for selecting 'Chabo-hiba' as the official cultivar name for the plant (Del Tredici, 1989).

## Nomenclature and Pruning

When I first started working with the Larz Anderson collection in 1979—and I had not yet discovered the Yokohama Nursery Catalogues—the Arboretum's accession records simply listed the plants as *Chamaecyparis obtusa*. This seemed strange to me, given that their congested foliage and contorted growth habit didn't look anything like the typical hinoki cypress. Was their distinctive form the result of genetic selection or of the annual pruning they had received over the course of their long lives? To resolve this question, I planted a ten-year-old rooted cutting from one of the Larz Anderson 'Chabo-hibas' in the ground to see how it would develop without pruning (Fordham, 1971). This cutting retained the dwarf habit and congested foliage of its parent until 1984, when it suddenly produced an upright leader with loose, feathery foliage. By 1989 the plant was a meter and a half tall and a meter wide; and now in 2006, at thirty-five years of age, it is approximately four meters tall by two meters wide and periodically produces abundant crops of cones that are characteristic of the species.

That this is typical behavior for unpruned 'Chabo-hiba' is attested to by the fact that the 1913 and 1914 editions of the Yokohama Nursery catalogue modified the listing of the plant to "*Thuja obtusa compacta* or Chabo-hiba," and published a photograph on a nearby page of a narrowly pyramidal conifer—5 to 6 meters tall—with the caption, "*Thuja obtusa compacta*". Clearly the nursery was using the same cultivar to produce dwarfed trees in containers as well as narrow, conical shaped landscape specimens. E. H. Wilson's 1918 photograph of the 'Chabo-hibas' at the Yokohama Nursery (see Figure 7) provides further confirmation that tall, conical plants and the dwarf spreading plants were one and the same.



A sheared specimen of "*Thuja obtusa compacta*" from the 1914 Yokohama Nursery catalogue.

The rooted cutting (#1100-71) propagated from one of the Larz Anderson 'Chabo-hibas' after 16 years of unpruned growth. The same plant in 2005, after 35 years of unpruned growth. Photos by Peter Del Tredici





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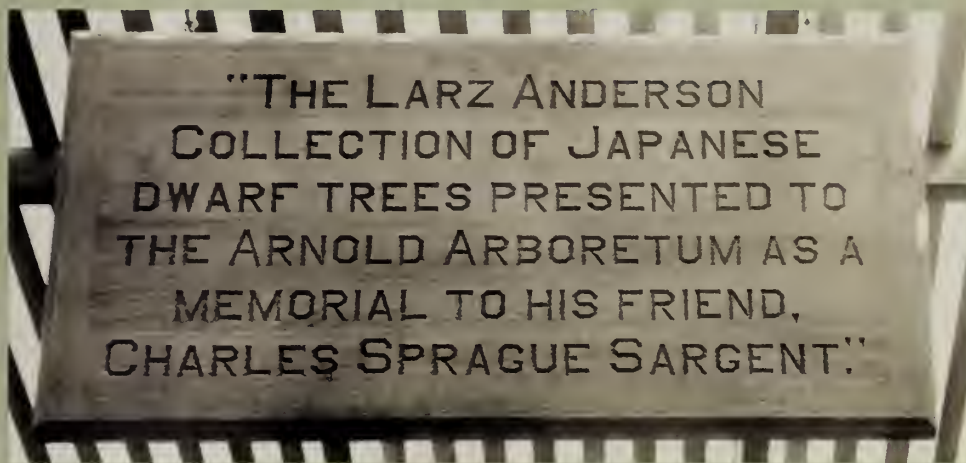
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## Acknowledgements

Many people have helped the author write this history of the Larz Anderson Collection. Foremost among them are Michael Levin, of Bonsai West in Littleton, Massachusetts, who provided me with a copy the 1899 Yamanaka Nursery Company Boston auction catalogue, and Dr. Tom Elias, Director of the United States National Arboretum in Washington, who invited me to speak at the 2002 Scholarly Symposium on Bonsai and Viewing Stones. I would also like to thank the Archivists of the Arnold Arboretum for their untiring assistance in tracking down illustrations for this book, and the staff of the Dana Greenhouses for their ongoing care of the Collection over the years. And finally, I would like to acknowledge the work of Dave Henderson whose photographs of the collection in 2005 grace this publication.

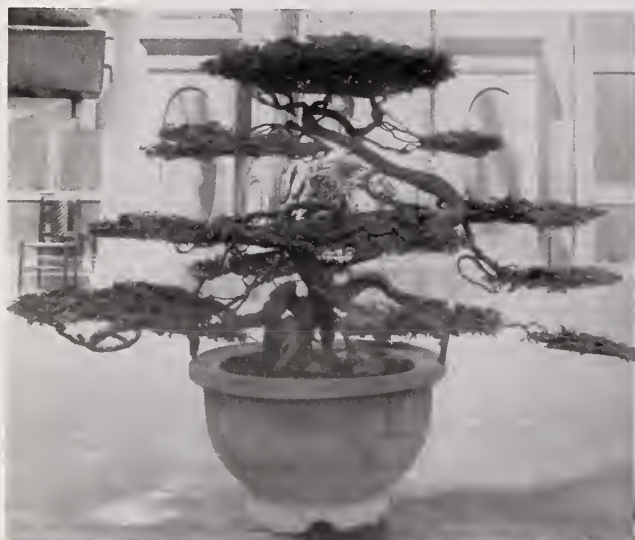
Peter Del Tredici has been the Curator of the Larz Anderson Collection of Japanese Dwarfed Trees since 1984. He is also a Senior Research Scientist at the Arnold Arboretum and a Lecturer in Landscape Architecture at the Harvard Graduate School of Design.

PORTRAITS OF THE  
LARZ ANDERSON COLLECTION  
1913–2005



All photographs in this section of the book  
taken prior to 2005 are from the Archives  
of the Arnold Arboretum. Those with  
the blue background were taken by Dave  
Henderson in November, 2005.







Facing page, top, *Chamaecyparis obtusa* 'Chabo-hiba' from the Yokohama Nursery Company on display at "Weld" in 1933. Note how wires were used to hold the branches in a horizontal position. The structure of the main trunk, with a heavy branch strongly curving to the right, indicates that it is the same plant as Arnold Arboretum #892-49, started in 1787. Illustration from *House Beautiful*, June 1933. Facing page, bottom, 'Chabo-hiba' #892-49, photographed at the Arnold Arboretum in 1952. Notice how the branches were tied to bamboo sticks in a desperate effort to maintain their horizontal orientation. Above, 'Chabo-hiba' #892-49, photographed in 2005. Note the same concrete container in all three pictures, as well as similar ones in Figures 4 and 7. The plant in its pot is 140 centimeters tall by 185 centimeters wide.







Trident Maple (*Acer buergerianum*), Arnold Arboretum #870-37, started in 1852. Facing page, top, the plant c. 1913; facing page, bottom left, a photograph of the plant in 1933 from the June, 1933 *House Beautiful* article; facing page, bottom right, the plant in 1954. Above, the plant in 2005. Note how it has stayed in the same container since its arrival in the United States. The plant is 85 centimeters tall by 85 centimeters wide.







*Chamaecyparis obtusa* 'Chabo-hiba,' Arnold Arboretum #877-37, the oldest plant in the Larz Anderson Collection, started in 1737. Facing page, top, the plant in 1954; facing page, bottom, the plant in 1987. Above, the plant in 2005, which is 127 centimeters tall by 140 centimeters wide.

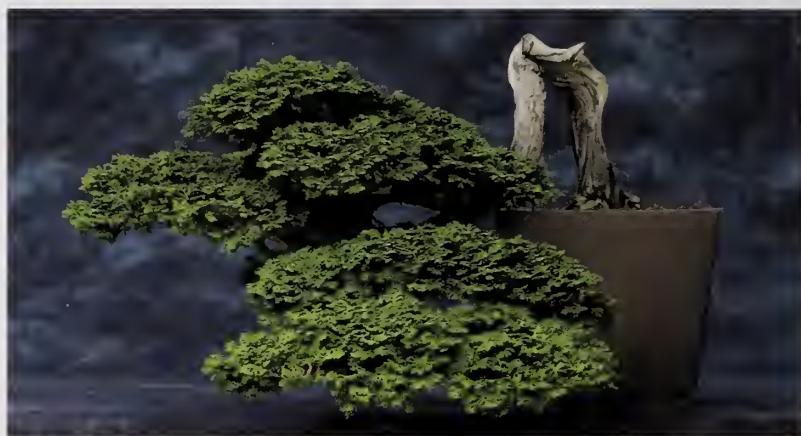




Japanese White Pine (*Pinus parviflora*), Arnold Arboretum #893-49, started in 1887. Above, the plant in 1952. Note how wires and bamboo sticks were used in training the branches. Left, the plant in 1965. Facing page, the plant in 2005, which is 177 centimeters tall by 82 centimeters wide.









*Chamaecyparis obtusa* 'Chabo-hiba,' Arnold Arboretum #879-37, started in 1802, and #101-69, its lower branch. Left, the mother plant in 1963 with its lower branch intact. Above, the mother plant in 2005, without its lower branch, 110 centimeters tall by 125 centimeters wide. Facing page, top, the final result of a successful operation performed by Connie Derderian on February 19, 1969. As she describes it, "A lower branch had split away from the main trunk of 879-37. Rather than cut it off and lose it, a wedge-shaped piece of soil was cut away from the root ball to create anew plant. It was put into the container on the right." Facing page, bottom, the lower branch after 36 years of independence.







*Chamaecyparis obtusa* 'Chabo-hiba,'  
Arnold Arboretum #878-37, started in  
1787. Facing page, top, the plant in 1938;  
facing page, bottom, the plant in 1954.  
Above, the plant in 2005. Note how  
the curved branch at the lower left has  
remained a constant, identifiable feature.  
The plant is 125 centimeters tall by 135  
centimeters wide.







*Chamaecyparis obtusa* 'Chabo-hiba,'  
Arnold Arboretum #881-37, started in  
1862. Facing page, top, the plant in 1965;  
facing page, bottom, the plant in 1987.  
Above, the plant in 2005, 110 centimeters  
tall by 140 centimeters wide.





13, 6

*Prunus Migueliana*  
(Fuji-yakura)  
富士桜



23 x 24 inches

For glass



Higan cherry (*Prunus subhirtella*), Arnold Arboretum #889-37, started in 1852. Facing page, bottom, the plant circa 1913; facing page, top, the plant in 1965 (note the same pot as in 1913). Left, the plant in bloom in April, 2005; above, the plant in 2005, 60 centimeters tall by 48 centimeters wide.









*Chamaecyparis obtusa* 'Chabohiba,' Arnold Arboretum #880-37, started in 1832. Facing page, top, the plant in 1954; facing page, bottom, the plant in 1963. Above, the plant in 2005, 82 centimeters tall by 90 centimeters wide.





*Chamaecyparis obtusa* 'Chabo-hiba,'  
Arnold Arboretum #890-49, started in  
1832. Above, the plant in 1965; right,  
the plant in 1989. Facing page, the plant  
in 2005, 100 centimeters tall by 90  
centimeters wide, with exposed stilt-  
roots that once clung to a rock.







Japanese Maple (*Acer palmatum*),  
#872-37, started in 1887. Right, the  
plant in 1976. Below, the plant in  
2005, 70 centimeters tall by  
70 centimeters wide.



Japanese Maple (*Acer palmatum*),  
#886-49, started in 1887. Right, the  
plant in 1989. Below, the plant in  
2005, 85 centimeters tall by  
90 centimeters wide.









Japanese Maple (*Acer palmatum*), #888-49, started in 1897. Facing page, top, the plant in 1954; facing page, bottom, the plant in 1987. Above, the plant in 2005, 98 centimeters tall by 100 centimeters wide.



# REJUVENATING AND RESHAPING THE LARZ ANDERSON 'CHABO-HIBAS'

Colin Lewis

**T**he compact hinoki cypresses (*Chamaecyparis obtusa* 'Chabo-hiba') in the Larz Anderson Collection are the elder statesmen of bonsai, the high priests whose secrets we had to learn before approaching them with tools in our hands. In their early youth, two or three centuries ago, their supple trunks had been wrapped around canes; their young branches pruned and tied into fanciful shapes, their foliage trained to form cloud-like layers. As the trees matured, the trunks and branches strengthened until their twisted shapes evoked coiled snakes trying to break free from the calm order and visual stability of the canopy or, perhaps, the violent energy of Mount Fuji's volcano held in check by the stable mass of the mountain.

By the time we began our restoration work in 1999, some of the trees' original branch structure had been destroyed—partly by nature, partly by man—but the essential design and conceptual intent were still evident. For a Western bonsai artist of the twenty-first century, the notion of restoring a collection of eighteenth-century bonsai was a humbling prospect. Rather than impose on these venerable masterpieces a twenty-first-century bonsai aesthetic, we hoped to restore their visual power by recreating the original design. It was not only the great age of the trees that gave them that power but also the masterly training and care they had received for so long.

## Rejuvenation Regime

When working with ancient plants like these, the restorer must spend a few years observing and learning from them before attempting major reshaping. In 1999 these trees were stable and healthy but not vigorous, so the first task was to rejuvenate them. We began by addressing the question of fertilization: changing the

regimen from a dose of dilute chemical fertilizer every two weeks to an application of dry organic fertilizer pellets to the surface of the pots every three months. We got noticeable results within the first year—foliage color improved and growth became more robust. This regimen is now the standard practice for all the trees in the collection.

The second problem concerned the amount of light the trees received. When the lath house was built in 1962 it provided the ideal balance between sun and shade; over time, however, the surrounding white pines had become large trees, creating far too much shade. Almost all the trees in the lath house showed the effects of insufficient light in weak or lost lower branches, strongly vertical growth of new shoots, pale foliage, and the absence of inner adventitious growth. By happy coincidence, the offending trees were removed to make way for the Leventritt Garden of Shrubs and Vines. Here again, after only a year the improvement in growing conditions was visible in better foliage color and stronger adventitious growth.

## Repotting the 'Chabo-hibas'

The third and most important part of the rejuvenation process—and the most difficult—was improving the condition of the roots. The central core in each pot was, and still is, a compacted block of centuries-old loam. (Much of it will remain there forever since it would be impossible to replace it without severely damaging essential roots.) The only area available for roots for annual growth was in the fresh soil that each tree received every three to five years during repotting, and it was here that changes were needed.

The volume of soil replaced at each repotting had been minimal: an outer shell no more than two inches thick. For large trees in such large



*The rootball of 'Chabo-hiba' 878-37 is showing signs of needing to be repotted. The parallel lines of root growth are due to the presence of grooves in the pot which directed the roots downward towards the bottom rather than around in a circle as is the case with more typical containers.*

containers, this was barely enough to maintain a minimal level of health and totally inadequate for regaining and maintaining vigor. Each year the roots had pushed upwards toward the surface in an attempt to escape the inhospitable conditions below. Once on the surface, they accumulated dust and detritus, in effect creating another layer of soil. Gradually the soil level had risen until the lower inch or two of the trunks was engulfed. By first lowering the surface of the soil to its original level (or even lower) we were able to use slightly shallower containers and still gain valuable space for fresh soil below the roots.

To increase the volume of new soil introduced when repotting, we had to remove more of the original soil. But rather than arbitrarily cut away "pie slices" of the root ball, we adopted a far more cautious approach. We carefully

remove the soil introduced during the previous repotting and comb out the roots to avoid excessive damage. Then we use a hose to wash away loose portions of the original core and reveal the more accessible areas around the exposed root ball. These areas are then carefully excavated in an operation that more closely resembles an archaeological dig than a horticultural exercise. In addition to copious amounts of lifeless clay, we have unearthed rocks, brick fragments, and pottery shards. With each repotting the volume of additional new soil increases. When we have finally removed around fifty percent of the original soil, the excavations will cease.

We also made changes in the growing medium. The commercial bonsai soil we used for the first few repotting cycles was made of calcined clay, sand, and decomposed organic matter. None of the ingredients had been sifted





*On old, pot-bound 'Chabo-hibas' the roots often grow upwards around the trunk. It is important to remove these girdling roots when repotting the plant. In this picture, taken in 1996, the removal of upward-growing roots exposed a full two inches of trunk that have previously been buried.*

and the organic matter in particular was little more than dust that tended to clog the air spaces among the larger particles. This soil—designed primarily for high-volume nursery production of tropical and subtropical plants—was unsuitable for long-term cultivation of hardy bonsai. The 'Chabo-hibas', in common with all the trees in the collection, require a growing medium with a coarser, more free-draining structure. The current recipe seems to be working well: 50 percent akadama; 20 percent calcined clay; 20 percent grit; 10 percent organic matter.

*Akadama* is an untreated, surface-mined, clay-like mineral with a granular consistency that it retains for many years, even when constantly wet. When *akadama* finally does break down into finer particles after some years, it does not become compacted, as do clay, loam, and even peat moss. In addition to structural stability *akadama* offers the advantage of allowing the roots to grow into and through the particles, not only around them, thus maximizing the volume and nutrients available for root growth.

Calcined clay, in this instance Turface®, is a clay that has been heated enough to drive structural moisture out of the grains so that they will not soften or break down when wet—but not so much as to reduce their porosity. These grains absorb a large volume of water and release it gradually and evenly to the roots. Grit is used to maintain good drainage and to prevent compac-

tion. Although the pots are large, the grit used is an eighth-inch aggregate of well sand #3. Larger particles would obstruct root growth while doing little to help drainage.

The ten percent of organic matter is supplied in the form of decomposed pine bark that binds with the minerals in the fertilizer to create a medium that not only supplies nutrients to the plants but also encourages the growth of beneficial microorganisms, which also helps to break down the outer edges of the remaining original soil. At each repotting, organic matter from the old root ball is salvaged and reintroduced with the new ingredients.

### Restructuring the 'Chabo-hibas'

As the trees' twisted branches had increased in girth over time, they had also straightened somewhat, a perfectly normal phenomenon in all conifers. In addition, they had grown outward and lost many of their inner branches. Consequently, each branch ended in a tuft of foliage far from the trunk, with no spatial relationship or harmony among the tufts. These remote tufts of foliage needed to be brought closer to the trunk and once again consolidated into clearly defined layers, and the trees' silhouettes needed to be restored to the denser and more stable pyramidal form of the original design, instead of the open, irregular shapes they had taken on.



*Colin Lewis is seen here using water pressure from a hose to wash away the old soil from 'Chabo-hiba' 877-37, exposing the plant's dense, fibrous root system.*



*The branches of old specimens of 'Chabo-hiba' are often extremely contorted as a result of their slow growth and the annual pinching they receive*

In spite of their great age, the trees had responded to the new soil and fertilizing practices within a year of repotting. However, it was three years before the new growth on the larger specimens was extensive and supple enough for training work to begin. Meanwhile, I was able to work on the three smaller trees and learn a great deal about the way 'Chabo-hiba' responds to various training techniques. One of the most surprising discoveries was that once the tension provided by multiple layers of dead bark has been removed, even hundred-year-old branches well over an inch thick are astonishingly pliable—a crucial factor in enabling us to restore the original design.

We quickly learned that normal wiring techniques, using annealed copper wire, are very

effective on branches up to three-quarters of an inch thick. We knew from the texture of the bark that the branches varied in age, but age seemed to make little if any difference in their response to being bent with wire. For example, a six-inch length of a branch a half-inch thick would accept an initial bend in the region of forty-five degrees and a quarter-inch thick branch would bend beyond ninety degrees, both seemingly regardless of age.

On larger branches, the very heavy wire and significant pressure needed to effect a bend might have resulted in scarring. We therefore pulled these branches into position with fine tension wires attached to other parts of the tree. Normally this method introduces gentle curves over the entire branch, with the branch requiring a long time to adopt its new position. Sharper curves adopt new positions much faster and, in this case, sharp curves were our aesthetic goal.

Where possible, then, we worked to sharpen the existing curves, focusing the entire bend more efficiently in a limited area and thus reducing the setting time. Manipulating the branch at the point of the bend before applying the tension wire and again when tightening it helps significantly to concentrate the bend at one point. The wire usually remains on the tree for about four months, the time necessary

for the branch to produce a new layer of wood. Beyond four months the damage to the bark may become too severe. If the tree is not particularly vigorous, the wire may stay on the branch for up to a year.

In one instance we successfully used a more drastic technique to lower a branch that was too thick and too short to respond to any other method. After cutting a fifteen-degree notch into the underside of the branch through about half its diameter, we pulled it down with tension wires until the cut surfaces of the notch were in close contact and under pressure. This was done in early June 2005; as of October 2005, no adverse effect on the health or vigor of the branch is evident and the two sides of the notch appear to have bonded perfectly. The tension



wire will remain undisturbed for another growing season.

The speed with which the branches adopt their new position, regardless of their age or position on the tree is another remarkable property of the 'Chabo-hiba' cultivar. After four months, most branches of a quarter-inch or thinner have set more or less permanently. Thicker branches with more severe bends can also set within four months although a second wiring is applied to consolidate the new position. This rate of setting contrasts with that of spruce, fir, and many species of juniper and pine, some of whose branches can take more than six years to become fixed in a new position.

### Pruning the Branches

Occasionally it has been necessary to remove a part or all of a heavy branch. Here again we adopted a cautious approach out of respect for the age and value of these trees. Removing too much foliage from a branch at any one time can seriously weaken it or even cause death, especially in the case of older trees with complex compartmentalization of the vascular system. Therefore, we do the work in stages, cutting away the targeted areas bit by bit. It is important to leave enough healthy foliage to sustain the balance and vigor of the branch as a whole. As more growth develops on the desirable portions of the branch, more of the undesirable portions can be removed.

Removing entire large branches is also a gradual process. We first weaken the branch by cutting away up to seventy percent of its foliage; we then continue to cut back new growth to further reduce the vigor of the branch. After one year, the branch can safely be cut back to a short stub, which then remains untouched for yet another year. At that time it is cut as closely as possible to the trunk unless, as we have seen in some instances, the vascular system at the base of the stub—known as a collar—is too complex or too fragile. In these cases the stubs will remain in place for the foreseeable future.

From time to time some of the smaller branches succumb to competition from their stronger neighbors and begin to deteriorate. New growth is reduced to almost nothing and the foliage becomes pale and inactive. This is

not a tragedy; rather, it is the tree deciding for itself which branches it wishes to rely on for the future and which it has no further use for. This helps us greatly by telling us which branches to discard and which to maintain. Furthermore, since the tree has spontaneously decided to bypass these branches, they can be removed instantly and without ceremony.

### Refurbishing the Foliage

Once the branches have been repositioned, we can begin remodeling the dense foliage layers, often referred to as clouds. Almost without exception, this calls for reducing the canopy's height and increasing its width to achieve a more horizontal appearance. Height can easily be reduced by pruning out strong vertical smaller branches and repositioning the more flexible lower growth. Foliage on lateral branches is left to grow freely until the extension shoots are robust enough to wire into position. This process took three years for the first trees we worked on but currently, thanks to the trees' continually increasing vigor, shoots can reach this stage in two years.

We use fine pruning for a variety of purposes: to eliminate weak shoots and give the healthier shoots more room to flourish; to direct future growth to where it is needed; and to eliminate growth where it is not needed. This kind of pruning is also used for other bonsai, but the foliage of the 'Chabo-hibas' presents its own unique challenges and rewards. For example, unlike many species of *Chamaecyparis*, whose foliage fronds or fans are presented in different planes, 'Chabo-hibas' (at least when grown in containers and heavily pruned) tend to present their fronds on a horizontal plane in all parts of the tree. It is hardly ever necessary to reposition wayward fronds with wire—they are so few in number that they can usually be cut away; and once any zone of foliage has settled into "horizontal frond mode" very few, if any, vertical fronds are produced.

An important part of foliage manipulation begins in late summer. At this time, a typical new shoot comprises two or three small (less than half-inch) recurved fronds at the base, then two or three medium-sized fronds up to an inch across and, overlaying all these, a spread-



*The mature shoots produce branchlets which overlay each other like tiles on a roof. The upper branchlets are larger and more vigorous than those below. By snipping off the larger upper branchlets and leaving the smaller and less vigorous lower ones, the foliage can be encouraged to become more dense and finely textured. At the same time, any branchlets that are not horizontal are removed.*

ing terminal frond that expands to a diameter of two inches or more if left unchecked. To increase bulk and encourage fine branching, we remove the terminal fronds entirely, leaving the two medium-sized fronds intact. These will develop during the following year into duplicates of the parent shoot, with equal vigor and size. Although slow, this process builds a more sturdy and organized network of smaller outer branches than merely allowing the foliage mass to expand without control.

With trees of this size, every process from branch shaping to fine pruning can be carried out simultaneously on different parts of the tree. The final process, however—building density—can only begin once the branch terminals are sufficiently balanced over the entire tree. Foliage density is needed not only to create a neater and more defined bonsai image, but also to allow the large clouds of foliage to be divided into smaller interrelated sections, giving the tree a more massive and more vibrant appearance.

So when the branch terminals have been properly established, we return to the shoots in late summer, this time cutting away almost the entire shoot and leaving only two of the very small, recurved fronds at the base. These fronds seem to be of a different nature from the others, as if destined to remain small. Their growth is slow but robust. Extension is rare

and is usually confined to one terminal, which is easily pinched off. Rather than try to extend these small fronds, the tree responds to the loss of a shoot by producing more small fronds from other internodes. Eventually the foliage becomes so dense that we must thin out some of the heavier branch terminals and allow younger inner growth to replace them.

This density-building technique has worked well, first on the small cascade (#101-69) and then on the two medium-sized trees (#880-37; 890-49). The larger specimens have not yet reached the stage of density building, although that time is near.

### Ongoing Maintenance

The gradual process of old soil removal will continue, ideally for several decades, until it is complete. Even after that, however, the roots should receive ongoing care and structuring in much the same way as do the branches. As new roots develop closer to the trunk, some of the heavy pieces at the extremities of the root ball can be removed. The eventual goal is to have the majority of the root ball consist of healthy young roots.

Restructuring the branches on the large trees will take perhaps another three to five years after which the focus will be on building foliage density. From that point forward, the trees will be maintained by a sort of micromanagement



*The foliage of 'Chabo-hiba' becomes tight and dense as a result of annual pinching.*





*Peter Del Tredici is seen here using a chop stick to tamp new soil around the older portion of the rootball of 'Chabo-hiba' 879-37, which he was repotting in March, 1996.*

that includes cyclical thinning and replenishment of branch terminals as well as selective fine pruning to guide foliage growth in anticipation of future thinning.

### **Overwintering**

In the milder parts of the United States, as in much of Japan, bonsai can be left out-of-doors all winter with only minimal protection from the elements. In New England, however, even though 'Chabo-hibas' are hardy in zone 5, the plants need to be protected from the cold. A plant that is perfectly hardy growing in the ground is not as hardy when grown in a container above ground and surrounded by air. This is because the soil, which has great insulating power, never gets as cold as the air, which has no insulating power.

The Arboretum bonsai are stored in a windowless concrete-block structure for the winter. The temperature in the building is maintained between 33 and 36 degrees Fahrenheit, and the plants are checked for water once a week. In general, they need watering about once a month.

Extreme care is taken to keep the plants from drying out during storage; it can be difficult to rewet them come spring. On the other hand, if the plants are kept too wet during storage, they become susceptible to fungal infections.

As long as the temperatures remain below 36 degrees, the plants survive in total darkness (and, surprisingly, continue to need water). However, such dark storage will not work at higher temperatures. The key to successful winter storage is to make sure that the plants are fully dormant before they go in and that they come out before they show any sign of growth. Traditionally, the plants went into cold storage on Armistice Day (November 11) and came out on Patriots' Day (April 19), but in recent years these dates have shifted to a week later in the fall and a week earlier in the spring as a result of changes in the weather.

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Colin Lewis has been working with the Larz Anderson Collection since 1998. He is the author of four books on bonsai and the founder of the Hô Yoku School of Bonsai. He has been a practicing bonsai artist for twenty-seven years.

## YOKOHAMA NURSERY COMPANY INSTRUCTIONS FOR GROWING DWARFED TREES

*The Yokohama Nursery Company Catalogues issued between 1901 and 1922 all contain the identical instructions for how to take care of the dwarfed trees that the nursery sold. This information is historically significant for being among the earliest English descriptions of how the Japanese took care of the plants. The instructions are reprinted below in their entirety. According to Dr. John Creech, these instructions were most likely written by Mary Unger, the American wife of Alfred Unger, the German horticulturist who operated the Louis Boehmer Nursery Company in Yokohama from 1890 through 1908.*

### Dwarfed Trees Growing in Jardinières and Their Cultural Directions

Treatment of *Thuja obtusa*. During spring and summer, by preference keep this plant in a sunny airy situation where the wind will pass freely through the branches; water once a day giving just enough to make the soil moist; in dry hot weather it may be necessary to give water twice a day. Care however should be taken not to have the soil wet and never water unless the plant needs it. Watering overhead in dry weather is bad but rain is always beneficial. During winter keep the tree in a cold greenhouse partially shaded, or in an unheated orangery, giving water about once in 10 days; the soil however must never be allowed to get dry. (The science of successful culture of all plants in pots consists in judicious watering, giving too much or too little is equally bad.)

Treated as above this plant is very ornamental on balconies, terraces, etc. If this plant is kept indoors, it should always be placed out-of-doors at night and as often as it is not wanted for decoration. Indoors it should never be exposed to the dry heat from a stove or open fireplace, otherwise the leaves will drop off and the plant perish.

*Pinus pentaphylla* and pine trees in general growing in jardinières require the same attention in watering and general treatment as *Thuja obtusa* but are not so much influenced by atmospheric conditions; nevertheless sun and air are necessary to maintain health, therefore keep the plants out-of-doors as much as possible.

Maples and other deciduous trees take the same treatment as *Thuja obtusa* as regards watering, but are much more accommodating than evergreens; in fairly mild climates the maples may remain out-of-doors all winter, but where the frost is very severe they should be kept in a cool cellar after the leaves have fallen in autumn; the soil must always be kept moist but not wet; early in spring put the plants out-of-doors and fully exposed to all weathers and when in full leaf use for decoration indoors as needed.

**MANURING:** When the trees commence growing in spring, we give manure twice a month, say March, April, May and June, again September and October. In the hot days of July and August, we give no manure and the same in winter and early spring, the plants then being at rest; the best manure is finely powdered oil cake or bone meal. To a jardinière one foot in diameter we give 3 or 4 large teaspoonfuls not heaped of this dry manure spread evenly around the edge of the jardinière; a



larger or smaller jardinière will require more or less. For a small jardinière, say three inches by six inches, half a teaspoonful will be ample each time.

**REPOTTING:** This is done by us once in two or three years as follows: lift the plant out of the jardinière and with a sharp pointed stick remove about one-third of the old soil around the *edges and bottom*, cutting away a portion of the *old fine* roots but none of the strong roots, then replace the plant in the same jardinière first looking to the drainage; for a small shallow jardinière we use a flat piece of tin or a flat crock over each hole; over this spread some rich fresh soil; neatly balance the plant and fill up with the same rich fresh soil to within one-half an inch of the rim; this holds the water and prevents the manure being washed over the sides of the jardinière; also the soil should be made sufficiently tight round the edges of the jardinière to prevent the escape of water, it being of the first importance that the entire ball of soil around the plant be moistened at each watering. Should the watering of the plant at any time be neglected and the soul has become quite dry, put the jardinière in a tub of water for 10 or 15 minutes, *not longer*, and if the injury is not too serious, the plant will recover. In the case of large plants, we use hollow crocks for drainage, the same as is used by growers of specimen plants. After several repottings, the plant having increased in size, shift into a larger pot, but as dwarfness is the thing aimed at, the smaller the shift the better. Repotting should be done in February or March just before spring growth commences.

We advise when it is possible to get the above work done by a good gardener who has been accustomed to the handling of heaths, New Holland plants, etc. In the care of *very* shallow jardinières we find it desirable annually to replace a portion of the old soil to maintain a healthy growth.

**PRUNING:** To maintain dwarfness in the trees, pinch back the young growth; this we usually do from April to the middle of June and always with the finger and thumb, a practice followed by the late Mr. Thomas Rivers of Sawbridgeworth,



England, when preparing his dwarfed fruit trees fruiting in pots. In *Thuja obtusa* we pinch out the points of the young growth all over the plant to maintain the form; this practice we also apply to *Cryptomeria* and all other conifers except *Pinus*. *Pinus*: we pinch out the points of the irregular growth simply to maintain the shape of the plant. Pomegranate, *Lagerstroemia indica*, flowering peach, flowering cherry, etc.: we pinch back the *nonflowering* shoots either before or after blooming. Wisteria: in July and August we pinch back all the young growth leaving only four or five leaves on each shoot.

Maple and other deciduous trees are pinched back at the same time as *Thuja obtusa* leaving two to four leaves as may be necessary to maintain the desired shape of the plants. Should a second growth be made, the same rule is followed of pinching out the points.

4. *Anemonopsis macrophylla*.

5. *Pteridophyllum racemosum*.







1905

*Wistaria Multijuga*  
white.

(Fragrant *Wistaria*.)

*Wistaria Chinensis*  
double purple.

The

**Yokohama Nursery Co., Ltd.**

21-35, NAKAMURA,

YOKOHAMA, JAPAN.

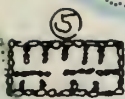
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GRAY HERBARIUM



EXPOSED  
LEDGE

STEEP  
SLOPE

WET  
GROUND

225

230

275

HP

# arnoldia

The Magazine of the Arnold Arboretum  
LANDSCAPE INSTITUTE INDEPENDENT PROJECTS





## SUMMARY

PONDS		ROCKY OUTCROP	
WETLANDS		RESIDENTIAL	
VERNAL POOLS		COMMERCIAL	
SURFACE DRAINAGE		MAINTENANCE VEHICLES	
GOLF COURSE		GOLF CARTS	
VIEW		FOOT TRAILS	
SLOPE 25%		SAFETY ISSUES	



SCALE 1"=100'  
INTERVAL 10'

**STEEP TRAIL AREA**

**VERNAL POOLS**

**UNSAFETY**  
**MEADOW**  
**CONFLICT DUMP**

**CONNECT (CON) WITH CONSERVATION TRAILS**

# arnoldia

THE LANDSCAPE INSTITUTE INDEPENDENT PROJECTS

## Volume 64 • Number 4 • 2006

*Arnoldia* (ISSN 004-2633; USPS 866-100) is published quarterly by the Arnold Arboretum of Harvard University. Periodicals postage paid at Boston, Massachusetts.

Subscriptions are \$20.00 per calendar year domestic, \$25.00 foreign, payable in advance. Single copies of most issues are \$5.00; exceptions are \$10.00. Remittances may be made in U.S. dollars, by check drawn on a U.S. bank; by international money order; or by Visa or Mastercard. Send orders, remittances, change-of-address notices, and other subscription-related communications to Circulation Manager, *Arnoldia*, Arnold Arboretum, 125 Arborway, Jamaica Plain, Massachusetts 02130-3500. Telephone 617.524.1718; facsimile 617.524.1418; e-mail [arnoldia@arnarb.harvard.edu](mailto:arnoldia@arnarb.harvard.edu).

**Postmaster:** Send address changes to

*Arnoldia* Circulation Manager  
The Arnold Arboretum  
125 Arborway  
Jamaica Plain, MA 02130-3500

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Detail of site analysis of landform views by  
Pamela Griffin, "Linking People With Plants."

### Inside covers

Detail of site analysis of Mt. Hood Nature Trails,  
Melrose, MA, from 2003 Independent Project by  
Kathleen Shamberger

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## EDITOR'S NOTE

Now approaching forty years old, the Landscape Institute's certificate programs have clearly influenced the evolution of the Institute itself in important ways. First offered in 1968 under the auspices of the Landscape Program of the Radcliffe Seminars, the certificate has become an important credential in the landscape design profession. Students come to the Institute for particular courses that meet their immediate needs. Others seek a working knowledge of the landscape design profession, choosing what they need and leaving after taking six or eight courses. Landscape history scholars take design studios to deepen their understanding of the design process or they take specific history courses to complement previous studies. But more and more students opt for one of the three certificate programs—landscape design, history, and preservation—each with its own complete curriculum. These programs have come to set the standard for education in the field; and the graduates' professional preparation is validated by the rigor and comprehensiveness of the required courses. (For listings, see <http://www.arboretum.harvard.edu/programs/ld/ld.html>.)

It's been five years since the Arnold Arboretum

assumed administrative oversight of the Radcliffe Seminars in Landscape Design, expanded the offerings, and changed the name. Much has remained the same, including the administration's willingness to develop new offerings in response to ever-changing demands. The Institute is now integral to the Arboretum's education mission and will complement its commitment to generating new knowledge in plant biology with programs that further our understanding of the role of plants in the human environment.

For this special issue we decided that the best vehicle for introducing the Landscape Institute to *Arnoldia* readers and illustrating the scope of its interests is to present a sample of final projects from the 347 completed since 1981, when digital records were first kept. (All 347, including the fifteen presented in 2006, are listed at the back of the magazine.)

In choosing the six projects included here we looked for a representative variety that could withstand drastic abridgement without losing their core meaning. The task of abridgement was ably undertaken by guest editor Jane Roy Brown, herself a graduate in landscape design history who writes on both contemporary and historical landscapes.

## INTRODUCTION

The independent project is usually the last step a Landscape Institute student encounters before earning the certificate in landscape design, history, or preservation. It represents a major commitment in time and cannot be undertaken until most of the course requirements have been fulfilled. After their topics are approved, students work with a faculty advisor who meets frequently with them for the full year or more that is needed to finish the project. In addition, as the coordinator of the program, I schedule regular seminars for all students working on independent projects; at these meetings, students present their works-in-progress and exchange critiques and suggestions.

The program requires students to focus on a specific area of landscape design or history and to

carry out a real or theoretical project from beginning to end. Ranging widely in scale from residential to regional, most case studies deal with public or semipublic landscapes. Typical final products include master plans for institutions; environmental policy recommendations for wetlands or other conservation areas; regulatory standards for urban developments; playground designs for schools and neighborhoods; studies of historical designs and designers; and plans for preserving historic landscapes. The clients include institutions and agencies such as the Massachusetts Department of Conservation and Recreation, The Trustees of Reservations, the National Park Service, and local cities and towns throughout New England. The projects listed below illustrate the breadth of interests at the Landscape Institute.

Most design and preservation projects are mutually beneficial: the community or institution gets help in solving its landscape-related problems while the student gains experience in dealing directly with a client. "Reclaiming Walden"—Joan Popolo's 2001 project—resulted in recommendations for re-using the Concord, Massachusetts, landfill. In 2005 Karen Longeteig presented proposals for street tree improvements at Lexington, Massachusetts, town meetings; and Phil Bevin's 1994 "Landscape Rehabilitation Plan for the Codman Estate for the Town of Lincoln, Massachusetts" was implemented to become Historic Massachusetts' outdoor museum. Heidi Kost-Gross' project, the York River Open Space Study (1995) grew out of a 1994 landscape studio project. The document was widely used and reprinted and helped to preserve open space in the York River watershed.

Many of the projects in landscape design have productive afterlives. They may be used by clients to get funding, to raise public awareness, to document important landscapes, or to get a long-delayed building process underway. Drawings for community improvements, be they playgrounds or streetscapes, often sit in office file drawers for years awaiting funding for implementation. Since graduates of the Institute usually

live near the areas of their projects, they remain available to work with local officials to raise public awareness, to write grants for funding, or to modify plans in response to the changing needs of the client, or to get a long-delayed building process underway.

Many recipients of certificates in landscape design history also continue to work on their projects after graduation, building on them, refining them, and often finding publishers. Alan Emmet's expanded project, "Changes in a Cambridge Landscape," (1977) was published by Harvard University Press. "Boston's South End Squares, Inventory, Analysis, and Recommendations" by Phoebe Goodman also evolved into a book, as did "Money, Manure, and Maintenance: The Life & Work of Marion Cruger Coffin, 1876-1957" by Nancy Flemming.

After my many years at the Landscape Institute—beginning when it was the Landscape Design Program of the Radcliffe Seminars—I am still impressed by the professional quality of the projects completed by our students. I believe that after reading the summaries of those that were chosen for this issue, you will feel the same way.

John Furlong

Director of the Landscape Institute  
of the Arnold Arboretum

## A Sampling of the Institute's Concerns

- *Sherborn Open Space Study*: a proposal for the use of open space in the rapidly growing community of Sherborn, Massachusetts
- *Dome Community Garden Study*, New York City: a history of the evolution of a community garden illustrating the political decisions that influence the shape of a community's open space
- *Common Places*: a proposal for realizing the full potential of the many town commons in the Town of Brookline
- *Schooner Park Development Plan*: a design for public open space at the town dock of Duxbury, Massachusetts, that reflects the town's shipbuilding traditions
- *Guidelines for Therapeutic Landscapes*: applying guidelines to develop a proposal for continuing-care retirement center communities in Hanover, New Hampshire
- *New Hampshire Landscape Inventory Study*: the first inventory of 350 historic and noteworthy gardens in the state
- *York River Open Space Study*: a study that resulted in recommendations for conservation and development around an endangered tidal river estuary in York, Maine
- *Landscape Plan for Cambridge Friends School*: a guide for the school as it expands both in size and enrollments, including public open space used by neighborhood residents
- *Master Plan for Chauncy Allen Park*: a plan for revitalizing a public park and restoring the historic "Grandmother's Garden" in Westfield, Massachusetts
- *The Paine Estate Development Plan*: a proposal for Wayland, Massachusetts, that includes an assisted living facility, 20 single-family homes, a soccer field, and walking and ski trails—all on 166 acres
- *Salk Institute Study*: an examination of the lessons to be drawn from architect/theorist/teacher Louis Kahn's La Jolla, California, landscape
- *The Congregational Church of Topsfield Plan*: a history of the town common and the historic church in this Massachusetts town
- *Plaza Del Sol, Lechmere Canal Area*: An imaginative look at a streetscape in Cambridge, Massachusetts, proposing ways to integrate commercial activities, social life, transportation, and open space





# Memories of a Bamboo Grove

*A Master Plan for Wakamatsu Park in Kobe, Japan*

*Ireine Nagai*

I have a memory from my childhood of a bamboo grove next to my grandparents' house, on the tip of the Izu Peninsula in Japan. The grove was dark and dense, and I remember being afraid of the shadows and the clucking sound the plants made. But when my grandmother told me that a bamboo grove is actually the safest place to be during an earthquake, I believed her, and my fears went away.

Now, twenty years later, I have proposed a design for a park filled with bamboo in Kobe, a cosmopolitan city of one and a half million people on the northwest shore of Osaka Bay. The design is my response to Kobe's urgent need for restoration following the 1995 Hanshin earthquake, which killed more than six thousand people and left hundreds of thousands homeless. It also reflects my childhood memories,

my personal experiences, both emotional and spiritual, and my hope for the future.



## The Parks of Kobe and Their Multiple Roles

During and after the massive earthquake that struck Kobe, parks offered sanctuary and safety. In some cases, their trees and vines prevented fires and kept walls from collapsing. As part of a large-scale redevelopment plan that takes future earthquakes into account, Kobe officials devised a "greenification" plan that identifies sites for various kinds of parks throughout the city. In addition to serving the usual purposes of urban parks, these will be places for citizens to gather in the event of future earthquakes and will provide access to emergency shelter and water supplies in underground reservoirs.

Situated in the western part of Kobe, Wakamatsu Park is near the residential and commercial district of Shinnagata, the area that suffered the most damage during the earthquake. The park was used as a shelter during the quake and has since been the site of temporary housing. The city is planning to rebuild the park on a plot of 1.6 hectares (four

acres) that will be surrounded by new high-rise residential buildings, shopping malls, offices, and hotels. The district will also become an important transportation hub, with a reconstructed train station and a new highway.

As the only substantial green space among all these buildings, Wakamatsu Park will be a destination for visitors and play an important role in the lives of community residents.

## The Many Valuable Qualities of Bamboo

Although some species grow very tall and stout, bamboo is not a tree, but a primitive, woody-stemmed grass. The hollow central stem with its many joints is called the culm. Some species are the fastest-growing plants in the world, generating more oxygen than any other plants. Instead of roots, bamboo has rhizomes, large underground stems that spread out rapidly through the soil. The result is a dense, interlocking web of fibers that holds topsoil firmly in place.

It is widely recognized that bamboo is especially useful in seismic regions, thanks to an internal structure that gives it unusual strength and resilience. In *The Book of Bamboo*, David Farrelly writes about the value of bamboo in creating a safe quake zone: "Dense growth of bamboo around a building functions in the soil as windbreaks act in air: rhizomes buffer the blow and diminish the intensity of motion. Widely planted in any quake zone, bamboo absorbs much of the earth's ripple [and] . . . provides immediate construction material for temporary disaster shelter."

Buckminster Fuller, who introduced the geodesic dome to architecture, experimented with domes made of bamboo. "This [bamboo geodesic dome] will provide more shelter to more people at less cost than any other structure possible," Fuller concluded.

But bamboo has also played an important role in the gardens and art of Japan. The designers of early Japanese gardens sought in their creations to achieve "yugen," a term that means tranquility but also suggests elegant beauty and a profound depth of kinship with nature. These designers were often Zen monks



The Shinnagata district in western Kobe suffered the most catastrophic damage in the Hanshin earthquake.



and were strongly influenced by Zen and ink monochrome painting. Their gardens provide ample evidence of bamboo's ability to create a variety of effects. Along paths, for example, tall species on either side form a canopy that lends a sense of intimacy. Densely planted bamboo at the corner of a path creates the illusion of entering a forest. Or, in a deep forest of bamboo, a curved path can achieve a subtle light that accentuates tranquility.

Near water, bamboo is useful because it is moisture tolerant. Planted as a background to form a vertical screen, it can evoke a mountain forest behind the water feature. And beside rocks or near buildings, bamboo provides contrast in color and texture.

Today's designers have avoided using bamboo in public landscapes because they regard it as invasive and difficult to maintain, as well as "primitive" and inconsistent with modern

design. But bamboo's growth can be controlled, and when species are carefully chosen, it has a unique ability to create a sense of repose that is as valuable in modern gardens as in ancient ones.

By using bamboo in Wakamatsu Park, I hope to reintroduce the values of bamboo into everyday life, to explore its potential for innovation, and to reconnect people with the "natural" aspects of their environment. As Kobe strives to become a more modern and international city through its post-earthquake renewal projects, bamboo can be a symbol of traditional values that must not be forgotten.

### **The Goals, Features, and Themes of the Wakamatsu Park Design**

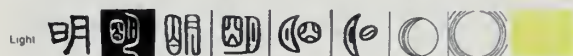
The design I created was directed toward achieving several specific goals: to create a tranquil environment that buffers the sounds of urban life; to offer recreational and educational opportunities; to provide easy access, open spaces, and shelter in case of emergency; and, finally, to permit recycling of natural resources.

These goals are to be achieved within a park that includes several specific components: open spaces for events and playgrounds, for capturing sunlight to use in solar heating, and for refuge during emergencies; resting areas that are insulated from street noise; a picnic area close to underground food markets and restaurants; a pool for collecting rain water and to serve as part of an emergency water supply system; an underground pavilion for food storage and to hold self-sustaining solar heating and water recycling systems in case of emergency; and underground parking with access to the park, to nearby buildings, and to the train and subway stations.

I based the park design on three thematic concepts. The primary one, inspired by traditional Japanese garden design, is the cycle of life, a symbol for an ideal environment that includes the entire universe. I began by reducing the Japanese pictographs for the celestial elements of sun, sky, and moon to elemental forms, which I superimposed on the outline of the site. I then abstracted the characters for



*A stand of tall bamboo, Phyllostachys aureosulcata. The fifty-plus species of Phyllostachys are native from the Himalayas to Japan and among them are the largest and most frequently cultivated hardy bamboos. They spread by rhizomes to form thickets.*



The cycle-of-life concept begins with simplified pictographs of sun, moon, and sky.

Pictographs for tree, water, and light also evolve into simple symbolic forms.

light, water, and tree and combined them with the celestial elements. Through these basic elements of nature, people will symbolically experience the cycle of life.

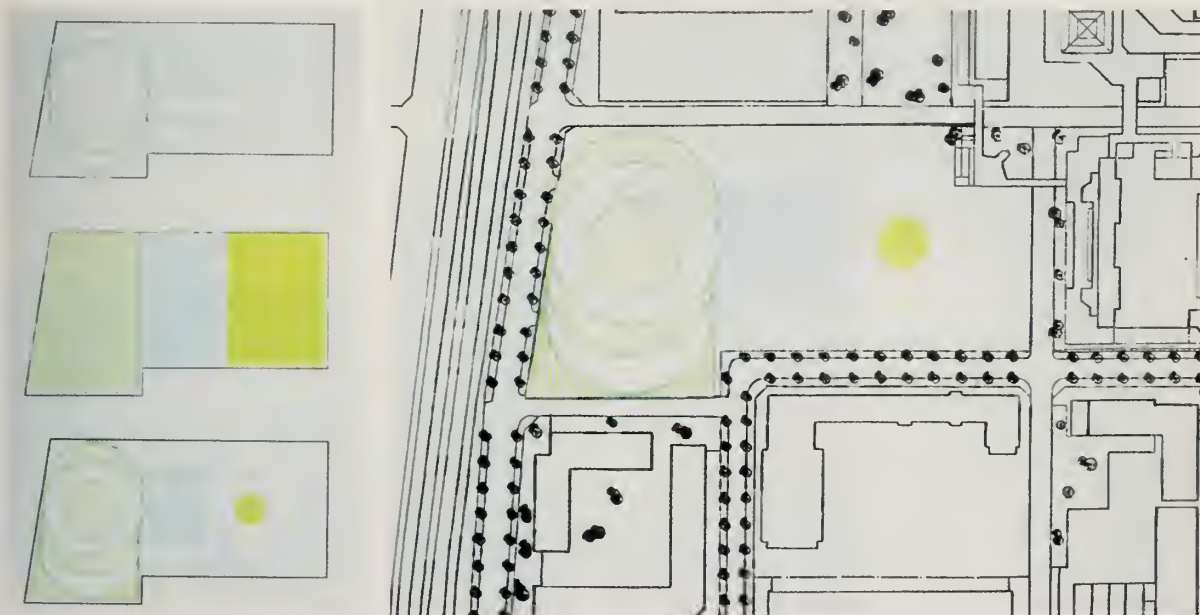
Within the formations representing the cycle of life are examples of sustainable technologies, the second theme of the park. These include equipment for conserving and recycling rainwater and for generating electricity from sunlight. By using natural resources in a sustainable way, the park will be not only a refuge in time of emergency but a demonstration of our dependence on the natural environ-

ment as well.

And finally, the third theme of the park will be a symbolic journey from earliest childhood to a dream of the future, using bamboo to create a variety of sensual and spiritual experiences.

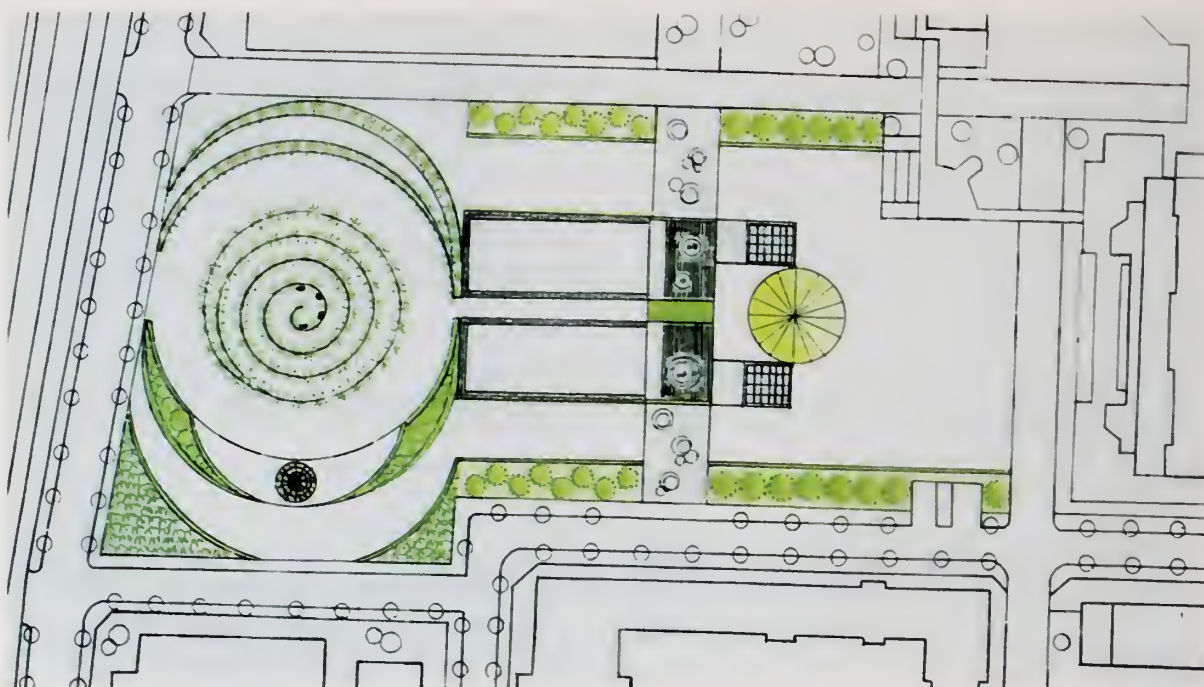
### Molding Features and Themes into a Master Plan

The park will have three spatial components. In keeping with Japanese tradition, each has a name that evokes its function: Shadows of the Moon, Reflecting Pools, and Rays of the Sun.



The conceptual diagrams project the program onto the site and illustrate the relationships between them.





The master plan for Bamboo Park. From left to right are the Shadows of the Moon, the Reflecting Pools, and Rays of the Sun.

In all three areas, visitors' experiences will be affected by the special qualities of bamboo, enabling them to escape from a hectic life into a tranquil setting and, perhaps, to remember happier times.

Shadows of the Moon accommodates areas for picnicking, resting, and playing. In the picnic area, a path lined with bamboo of the species *Phyllostachys aureosulcata* will take visitors to a seating area where they can enjoy lunch in the shade, protected from the noise of traffic and from the wind that whips around tall buildings.

The resting area, structured by bamboo planted in the form of a spiral, is intended to transport adults back to a realm of happy childhood memories and to introduce children to the plant. At the center of the spiral, visitors discover a surprise planting of *Phyllostachys heterocycla*. This space recreates a well-known scene from a traditional story that begins with a childless farmer cutting down a tall bamboo, only to find a small girl standing on the spot where the plant had stood. Sitting on a rock bench, enjoying the rustling of bamboo leaves with a companion, perhaps a child, a visitor may be prompted to tell the story of

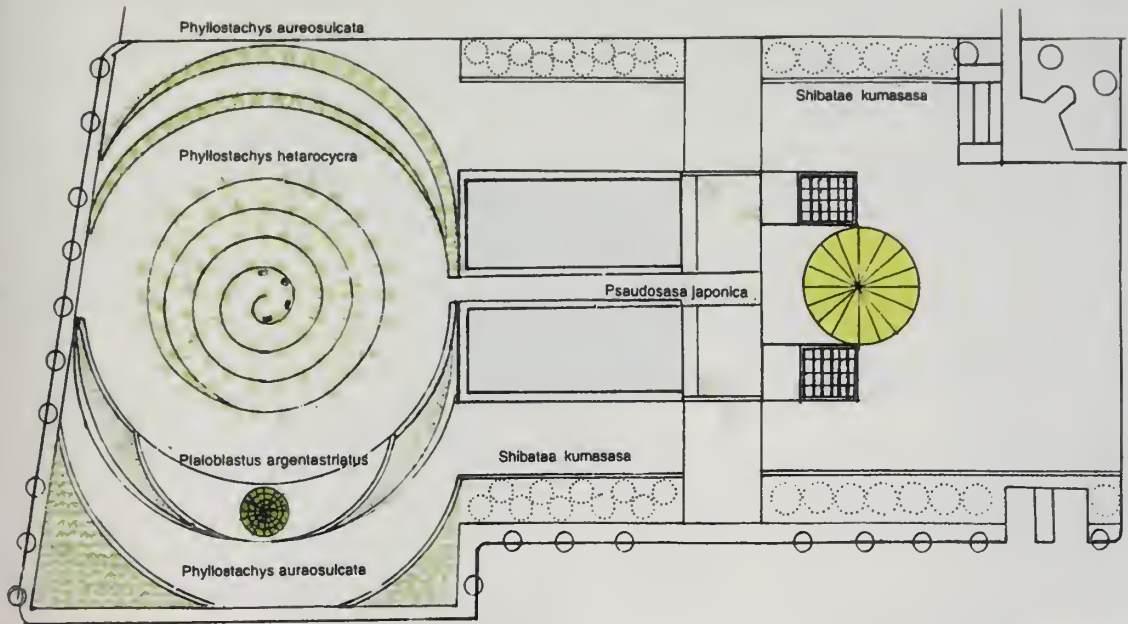
how the child, nurtured by the farmer, grew into a brave princess.

In the playground, surrounded by low plantings of *Pleioblastus argenteostriatus*, children can climb on a small bamboo dome inspired by Buckminster Fuller. A grove of *Phyllostachys aureosulcata* serves as a safety barrier between the park and the road.

The second area of the park is called Reflecting Pools: The Path of Meditation. The water pools here mirror the sky, symbolizing transitions in life. The path along the pools thus invites visitors to reflect on their past, present, and future.

The quiet sound of running water becomes louder at the end of the path, where water rushes over a waterfall. Flowing water, like life, is constantly evolving, and its sound can soothe minds churning with pressures and uncertainties.

Bamboo is used all along the pools to mimic the flow of water. The short *Shibataea kumasasa* are pruned into a rounded wave pattern, and the undulating bamboo fence also imitates the motion of waves. At the end of the sloping path, a bamboo bridge leads to the underground bamboo courtyard, where the pat-



Planting plan.

terns of water are repeated in the sand of a traditional "dry water" garden. Sand represents the ocean, and rocks and bamboo stand in for islands and mountains. Here, a few *Pseudosasa japonica* stand straight up in a sea of gravel raked into water patterns. Throughout this space, bamboo reinforces the sense of flowing water and the feeling of change that frees the mind from negative thinking.

Finally, in the below-ground-level pavilion, called Rays of the Sun: Illumination, the visitor follows a path to an open space. Along the path, *Shibataea kumasasa* are pruned in rounded shapes that reflect the radial pattern of the sun. A bamboo dome rising above the ground's surface symbolizes the sun and lights up a large open space where people can gather for events and to admire the resilient strength of the bamboo structure.

The bamboo walls of the pavilion cast a pattern of light and shadow. In the center one can enjoy the rays of the sun and the warmth generated by the solar heating system. Here, bamboo stands as a symbol of illumination and hope, and demonstrates its strength and flexibility through the use of a new technology.



Shrubby plantings of *Pleiolobatus argenteostriatus* surround the playground.

Irene Nagai's independent project was part of Kobe's Restorative Post-Earthquake Urban Redevelopment Program. In addition to her formal design studies, she visited many garden and parks for a sense of the spatial experiences bamboo can offer. She also interned at the New England Bamboo Company to learn bamboo culture and propagation. She received the certificate in landscape design in 1998.



# LINKING PEOPLE WITH PLANTS

## *A Master Plan for the Pine Tree State Arboretum*

*Pamela Griffin*

**T**he Pine Tree State Arboretum in Augusta, the capital of Maine, occupies 224 acres of open fields, deep forests, ledges, and wetlands. The state purchased the land in 1835 and farmed it to meet the needs of the state hospital for the mentally ill until 1972. In 1981 the state's Bureau of Public Lands and the Maine Forest Service founded the Pine Tree State Arboretum on the property, with both agencies providing staff and funding. While the state agencies continue to provide support, the

Arboretum is now a private nonprofit corporation governed by a board of directors.

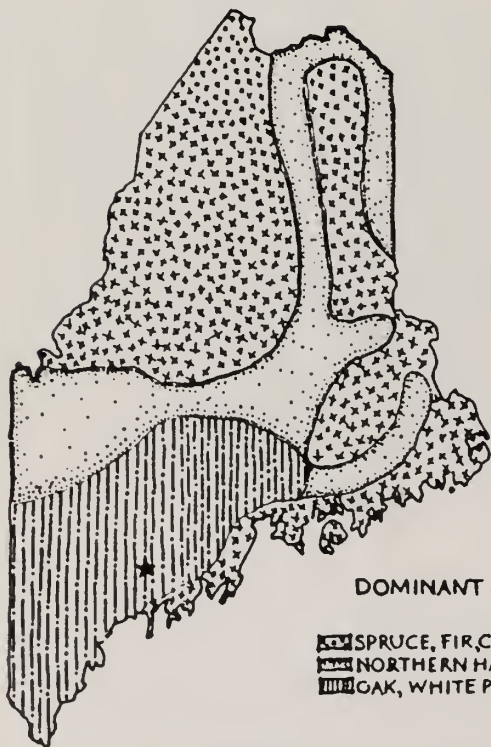
In 1996, the staff and the board felt strongly that it was time to step back, evaluate the progress of the Arboretum, and make plans for its future. As part of this effort I collaborated with the staff and board to prepare a master plan that would establish a permanent design policy and guide the institution's physical development over the next ten years. Specifically, the team's task was to develop an organizing theme applicable to all existing and future collections in order to give a sense of unity and aesthetic continuity to the Arboretum, and to extend public access to all parts of the grounds.

### Site Analysis

The planning team began its work by investigating the natural and cultural processes that had shaped the site so that we could then define its opportunities and limitations. Only with an intimate understanding of the land could we identify and enhance its unique qualities and link them to the surrounding region.

A series of maps was drawn up to illustrate nine characteristics of the site. Together these maps form a graphic representation of the physical factors that guided our decisions about design. Only six of the nine site characteristics analyzed for this study are included in the discussion that follows; omitted are microclimate, visual qualities, and regional characteristics.

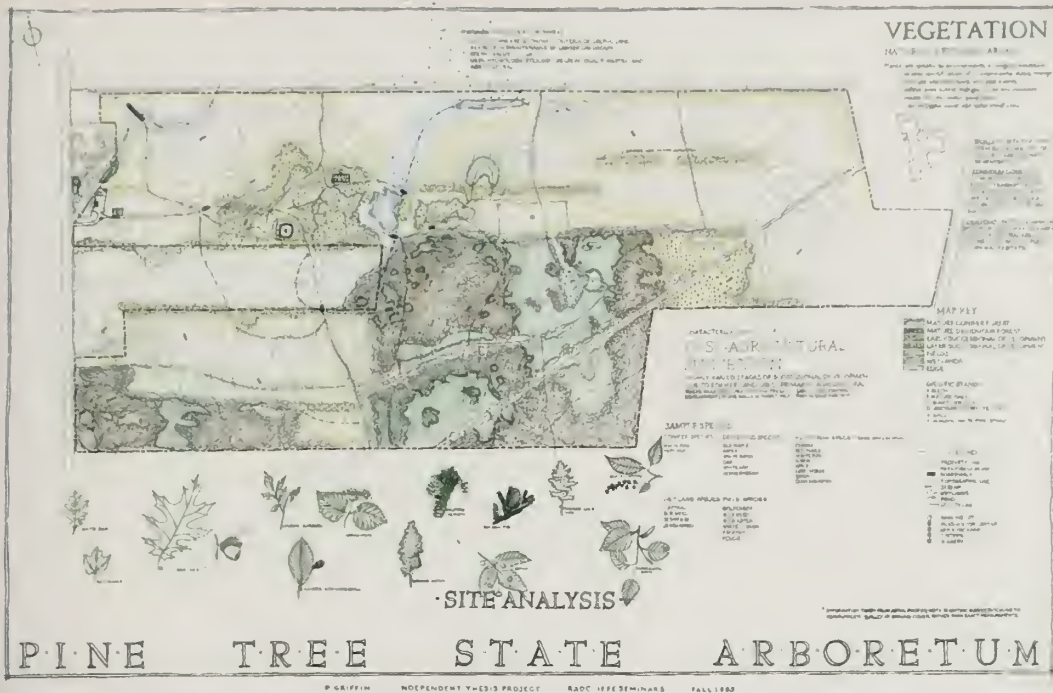
### FOREST TYPES



### DOMINANT SPECIES

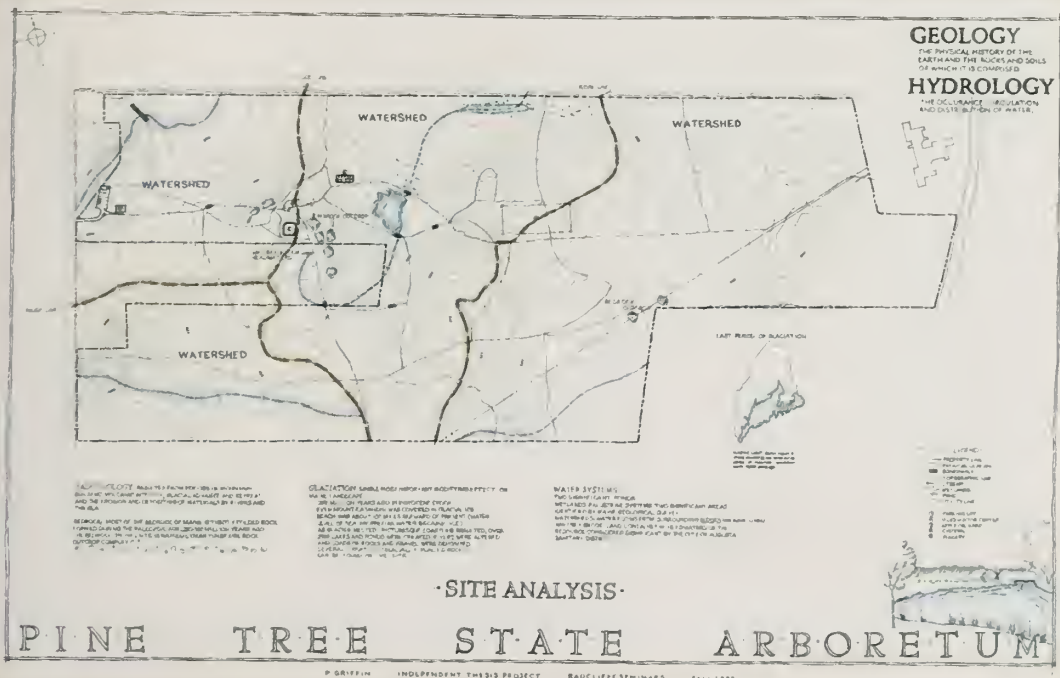
-  SPRUCE, FIR, CEDAR AND LARCH
-  NORTHERN HARDWOODS
-  OAK, WHITE PINE AND HEMLOCK

*Pine Tree State Arboretum is in Augusta, Maine's capital. Surrounding forests are dominated by oak, white pine, and hemlock.*

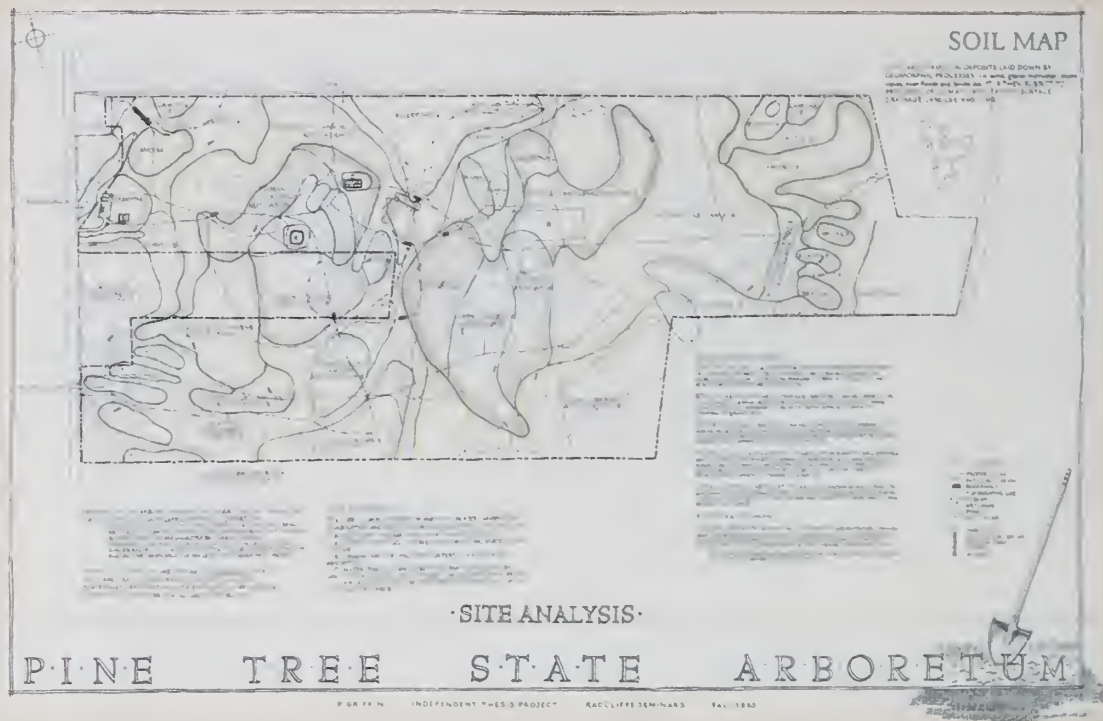


Above: To preserve native species and teach visitors about local ecology, knowledge of existing plant communities must be thorough. Most of the land is in post-agricultural succession.

Below: *Geology defines any landscape, including its soil composition and its acidity and alkalinity levels. Hydrology determines the life forms the site will support.*

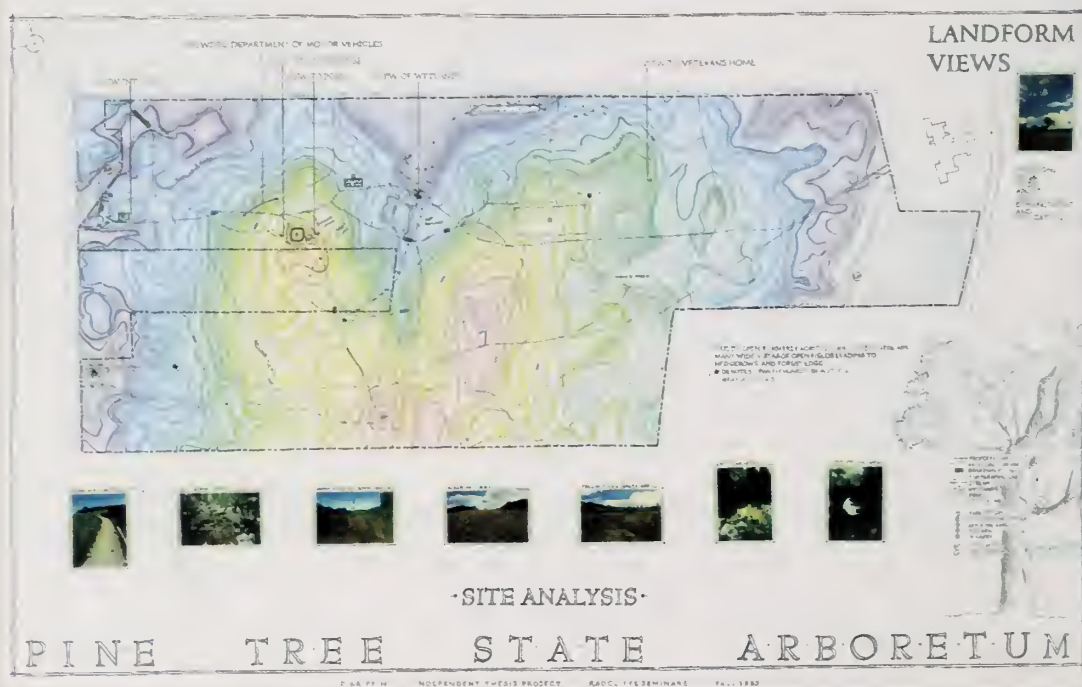


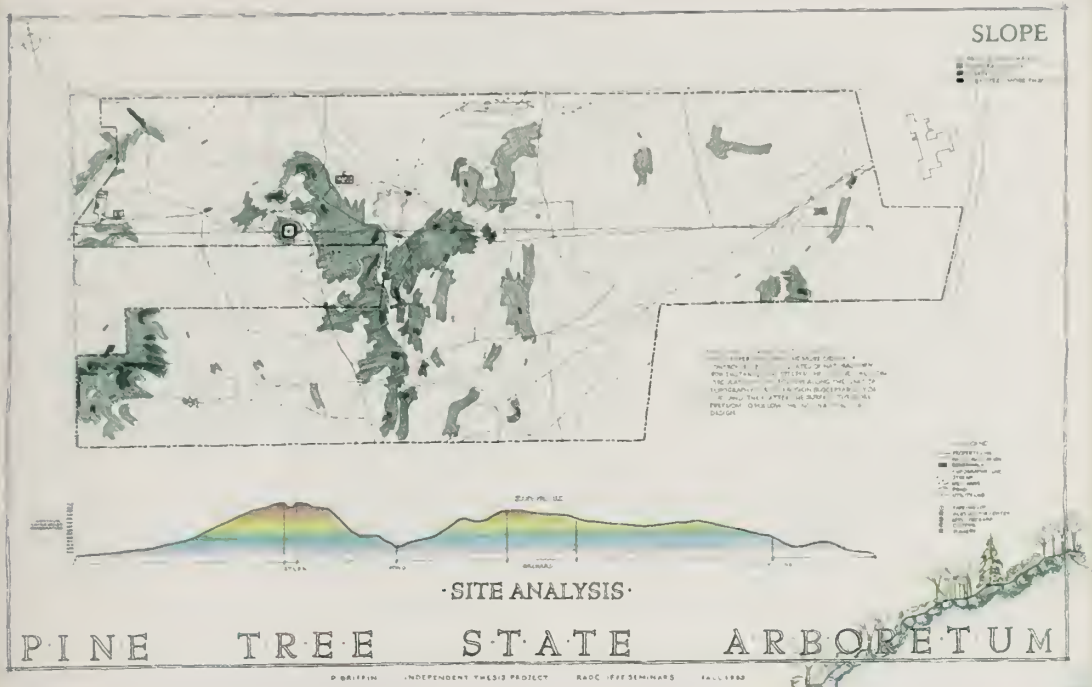




*Above: Analysis of soil types provides information for the placement of buildings and plants.*

Below: This map shows the property's high and low points and the resulting views.





Above: The placement of paths and gardens will be guided by the steepness of slopes. The map shows that gentle, rolling hills are the rule on the property, with only a few steep areas.

Below: It is the plant collections that distinguish an arboretum from a park or a nature preserve. This map shows the existing collections at the time that work on the master plan began.





## Synthesis

Several features emerged from our site analysis as significant, suggesting some initial goals to guide our planning:

- preserve the existing natural communities;
- explain the stages of species succession that have followed the discontinuance of agriculture;
- emphasize the exposed bedrock at the high point of the site;
- preserve and explain the watershed system;
- maintain open agrarian views;
- manipulate microclimates for human comfort and to create zones for more delicate plants;
- provide explanatory materials about historical features;

- integrate the existing plant collections into a wider framework; and
- improve visitor circulation throughout the site.

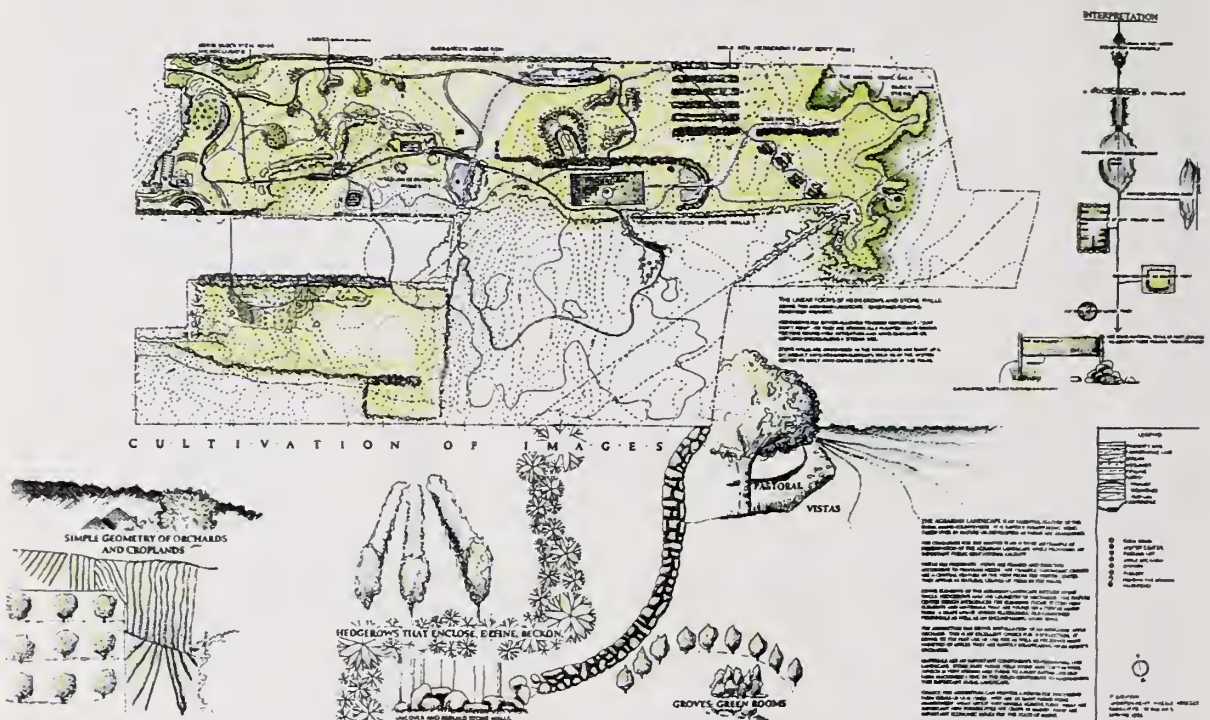
These goals suggested an organizing theme for the Arboretum: the story of Maine's landscape as shaped by its people, with emphasis on its agricultural and forestry traditions. But the site analysis also highlighted the Arboretum's potential to provide vitally needed public education about Maine's future and to illustrate the value of thinking globally, while acting locally, when confronting issues of ecological degradation and species loss. At the same time in recognition of funding and staffing restrictions, the planning team decided that the design should make use of existing site conditions and local materials as much as possible.

## THE PINE TREE STATE ARBORETUM: SPIRIT OF THE MAINE LANDSCAPE

### AGRARIAN LANDSCAPE

UTILITY AND BEAUTY

LIVING OFF THE BOUNTY OF THE LAND AND GIVING BACK



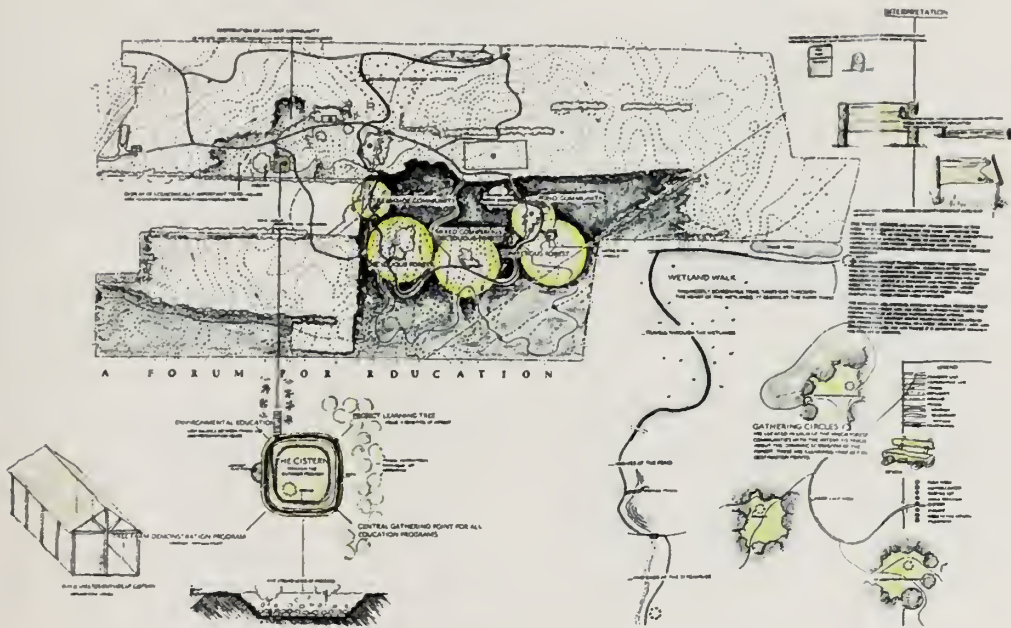
This drawing and the one that follows represent the two defining features of the Arboretum's landscape, fields and forest.

## THE PINE TREE STATE ARBORETUM: THE STORY OF THE MAINE LANDSCAPE

## THE MAINE WOODS

BALANCE OF ENVIRONMENTAL AND ECONOMIC DEMANDS

VILLAGE OF KENNEBEC



## Drawing Up the Master Plan

In this phase of the process the team incorporated all the goals and opportunities listed above into an actual plan, striving to establish a coherent design while maintaining enough flexibility for future growth. Five drawings were then made to illustrate the thematic components of the plan.

## The Agrarian Landscape and the Maine Woods

These two drawings display the two main features, fields and forest, that define the Arboretum landscape. The challenge for the planners was to build design themes around these features and create a sense of their value.

Using the agrarian landscape, for example, we wanted to demonstrate that as agriculture declines in Maine, the Arboretum can be a model for preserving open vistas and other traditional elements of farmland. The design accomplishes this by using the linear forms of stone walls and hedgerows to complement the

flowing lines of the natural topography. Old stone walls will be uncovered and new ones built, and interpretive signs will tie together such historical features as the cistern, the pigery, and the three embanked ponds. The visitor center will be relocated, enlarged and enhanced with features such as an entrance garden called the Maine Landscape Garden. It will integrate agrarian elements—an old-fashioned perennial garden, a grape arbor, and a sinuous stone wall—into a design based on the gardens of typical farmhouses.

The other design theme focuses on the Maine woods and wetlands. The forest is central to the state's identity, and it is imperative that commercial use of the forest be balanced by environmental stewardship. For that reason, the team emphasized public education in considering how to illustrate this theme. The cistern will be a central gathering place for outdoor education, its walls refitted with a level surface for amphitheatre-style seating. Native shrubs will line the outer perimeter, and an attractive rustic shelter will provide weather protection. A series of outdoor classrooms will



surround the cistern, with displays on ecology, resource utilization, and woodlot management.

A woodland walk will take visitors through the major forest communities. Clearings in each plant community will provide seating and interpretive displays about forest succession, native species, wildlife habitats, and other topics. A wetland boardwalk winding through the watershed system will feature interpretive devices, including maps and text panels. Guided tours will also be offered.

### Plant Collections

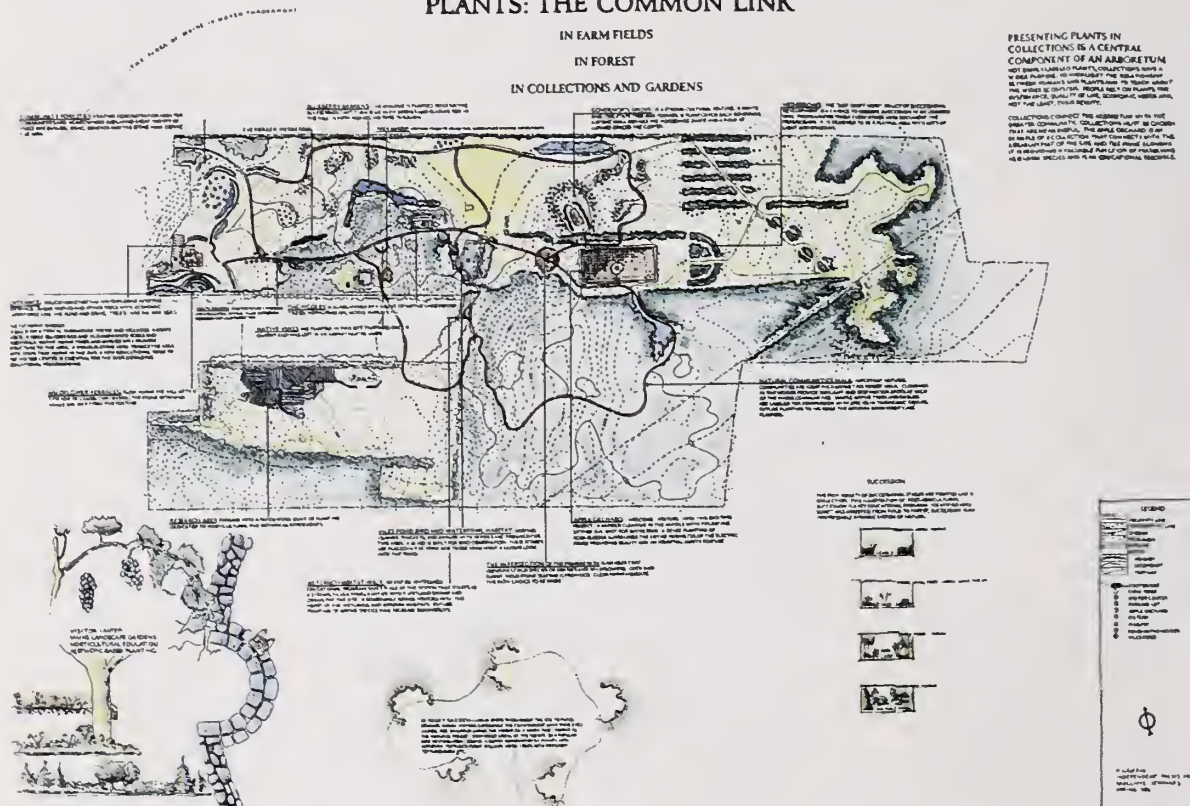
The planners felt that the plant collections should not simply be labeled exhibits but should also provide a link to the greater community and its history. To demonstrate a connection with the site's agricultural past as well

as with the present Maine economy, for example, the heirloom apple collection should both preserve heirloom varieties and show visitors how to establish an orchard. Accordingly, the Arboretum's collections were divided into three major categories, each intended to have distinctive interpretive materials:

- the Maine Landscape Garden at the entrance, which will include specimens from the horticultural collections;
- the taxonomic collections and other special gardens, such as the hosta garden, the Viles Pond bird and waterfowl habitat, and the rock garden;
- the existing natural habitats, which include the post-agricultural successional communities as well as the forest and wetland communities.

## THE PINE TREE STATE ARBORETUM: LINKING PEOPLE WITH PLANTS

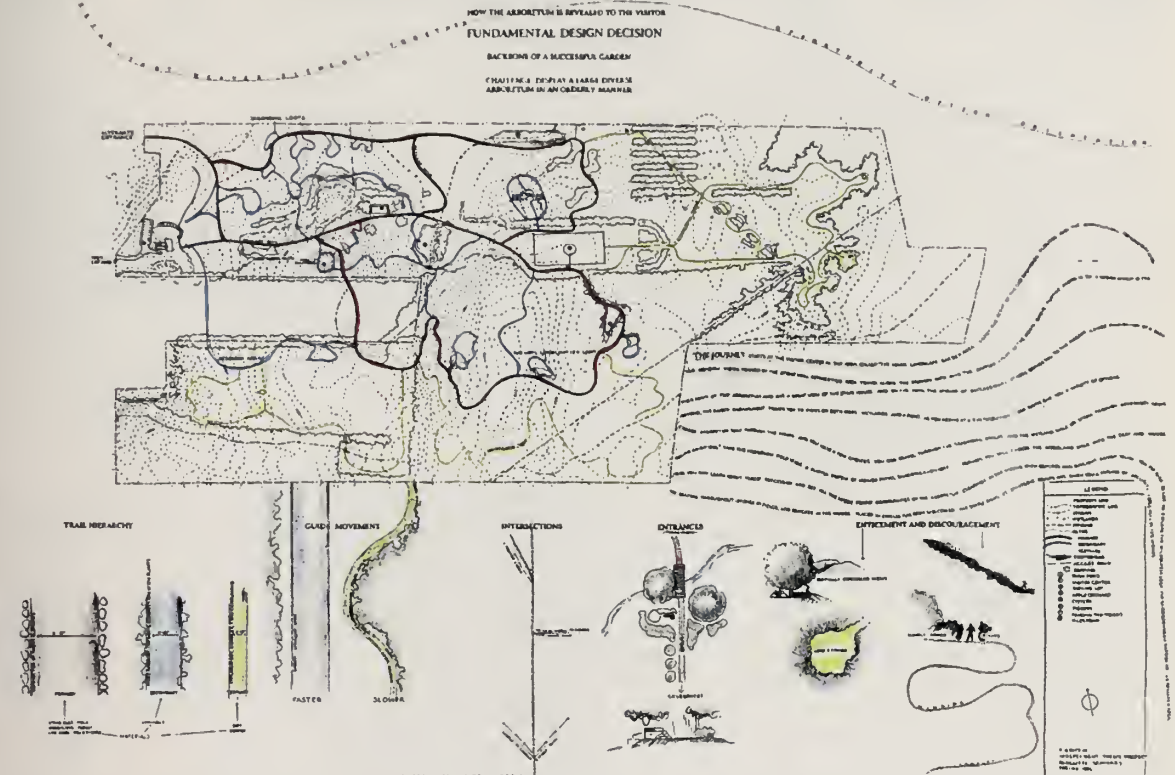
### PLANTS: THE COMMON LINK



The design proposal identifies ways to use the plant collections to more meaningfully connect the Arboretum to the greater community.

# THE PINE TREE STATE ARBORETUM: CENTER FOR A DIALOGUE WITH NATURE

## CIRCULATION



*A hierarchy of trails allows visitors to feel safe while exploring the landscape and brings order to the Arboretum's diverse display collections.*

### Visitor Circulation

It was decided that the trail system would serve not just to get visitors from here to there but also to reveal the land through sequential experiences, each of which affects the perception of the next one.

The plan outlined a hierarchical arrangement of paths and orientation devices that would allow visitors to feel safe while enjoying their experience. A main loop providing access to all major features will be clearly identified by width, surface treatment, and a distinctive edge. Narrower secondary paths will bring visitors directly to major features, and winding tertiary trails will offer exploration and discovery. The design of intersections and transition areas will also help to guide the visitor, with focal points such as the cistern and piggery situated so as to aid in orientation.

Developing a sense of unity was one of the

most important objectives of the master plan and the overriding challenge for the Arboretum. As outlined in the summary above, the planning team addressed this challenge in several ways:

- by interweaving two thematic landscapes, fields and forest;
- by clarifying the educational mission through the selection of collections and interpretative programs;
- by establishing a circulation system that balances hierarchy and mystery;
- by designing guidelines that include the repetition of certain forms, the use of local materials, and an emphasis on local culture.

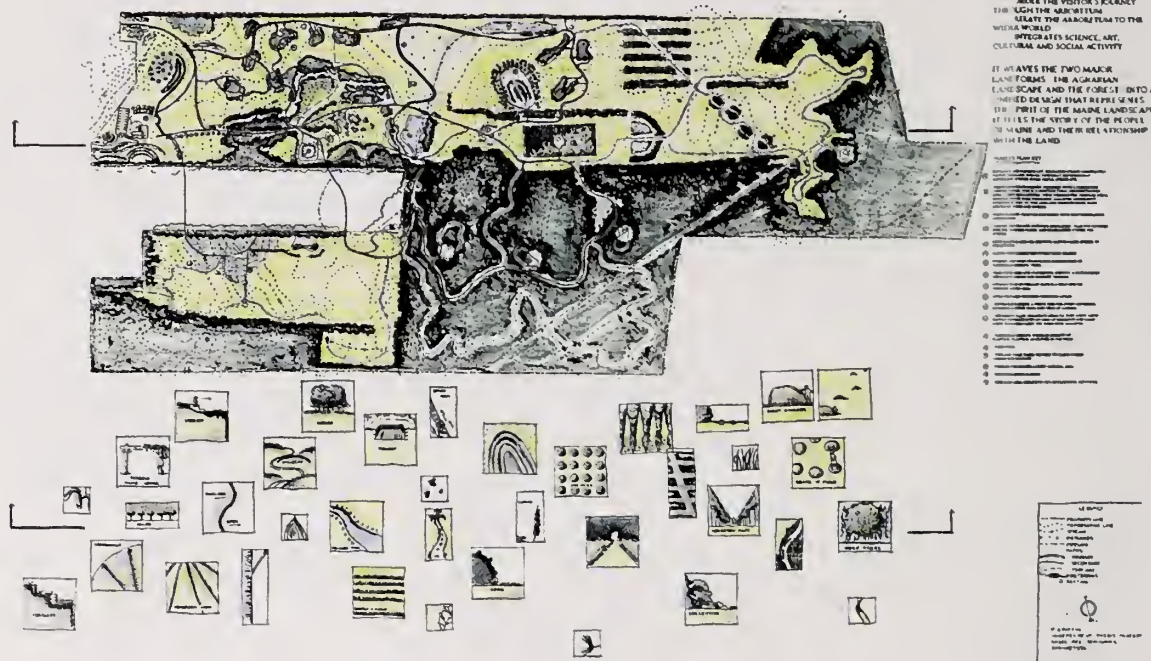
We believed that if the staff and the board applied these basic design guidelines throughout the Arboretum, they would create a facility that integrates science, design, local culture, and social activity for the betterment of the



# THE PINE TREE STATE ARBORETUM: THE MASTER PLAN A UNIFIED LANDSCAPE

WHOLE PREDOMINATES OVER THE PARTS

WITH THE ARBORETUM AS A CENTRAL THEME, THE PLAN IS  
AN ATTEMPT TO RECONSTRUCT THE LANDSCAPE, A LANDSCAPE  
DESIGNED TO BE A PART OF THE PINE TREE STATE ARBORETUM  
AND TO BE A PART OF THE PINE TREE STATE ARBORETUM  
AND TO BE A PART OF THE PINE TREE STATE ARBORETUM



*The plan weaves a central theme throughout the landscape, achieving unity in orderly circulation, by repeating forms and materials, and establishing a uniform palette of materials for signs, furniture, and paths.*

surrounding community and the greater world, and that leads visitors to an understanding of natural processes in a way that connects them to what is happening on a global scale. At the same time, the Arboretum would help Maine residents maintain the natural beauty of their native landscape and define the parameters of a sustainable economy. Perhaps most important, it would be a place to experience the renewal and peace that come from visiting a beautiful landscape.

## Postscript

In the nine years since the master plan was completed, it has provided a long-range vision for the Arboretum's staff and board members. It has proven flexible enough to allow the staff to respond to new opportunities—creating a new program for home schoolers; installing a native plants garden; and completing a large new addi-

tion to the visitor center in recognition of the desire for more educational programs. The staff continues to work with limited funds but is nevertheless now updating the plan in response to new challenges and opportunities.

Since completing her certificate in landscape design in 1999, Pamela Griffin has worked in Maine for landscape architectural firms; researched and wrote a cultural landscape report for historic trails in Camden Hills State Park; conducted a survey of Maine's cultural landscapes; and designed several outdoor classrooms. She recently completed a master's degree in biology with a thesis on plant ecology at the University of Southern Maine, Portland, and plans to enter the growing field of ecological design and mapping.



# Playground

*Planning a Playground for the Driscoll School in Brookline, MA*

*Mary Dennis*



Parks and playgrounds are now a part of most cities and towns. In Brookline, for example, so many are scattered throughout the town that a place to play is within a five-minute walk for almost every resident. These open areas are the town's complement to neighboring Boston's Emerald Necklace, and they provide Brookline's neighborhoods and schools with their own little jewels.



*Boston's Emerald Necklace is a linked system of parks, ponds, and parkways over five miles long. It was designed by Frederick Law Olmsted in 1875.*





One of the most heavily used playgrounds in Brookline is at the Driscoll School. Throughout the day it is filled with children playing. But playgrounds, like sneakers and clothes, get old and worn out after years of use by hundreds of children, day after day after day. This is the story of what happened when Driscoll's playground needed renovation.





*"We need clear views into the playground."*



*"Emergency and service vehicles must be able to get onto the playground."*



*"Basketball courts need to be placed so neighbors are protected from noise."*



*"The playground must be easy to take care of."*

First a plan had to be developed. So there was a meeting. WELL . . . actually, quite a few! Lots of people gathered together, neighbors and parents, teachers and students, the town planning department, the police, and even the DPW crew. All these folks had ideas and concerns to discuss and review. (There were so many it created quite a stew.)

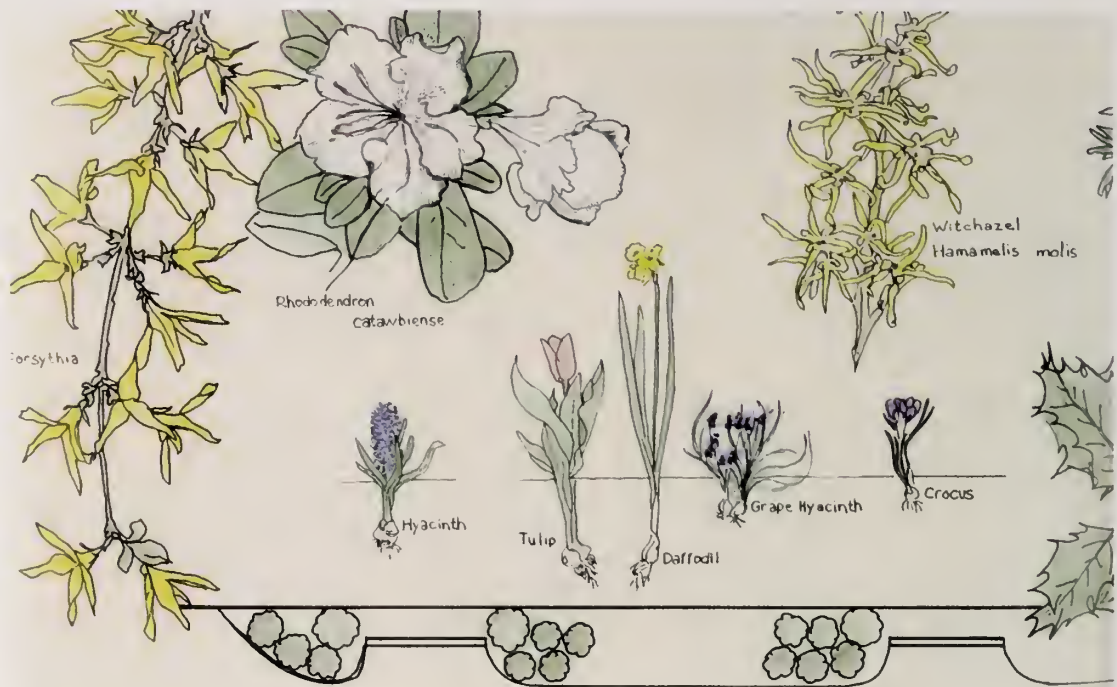


*"The playground should be attractive for both children and adults."*

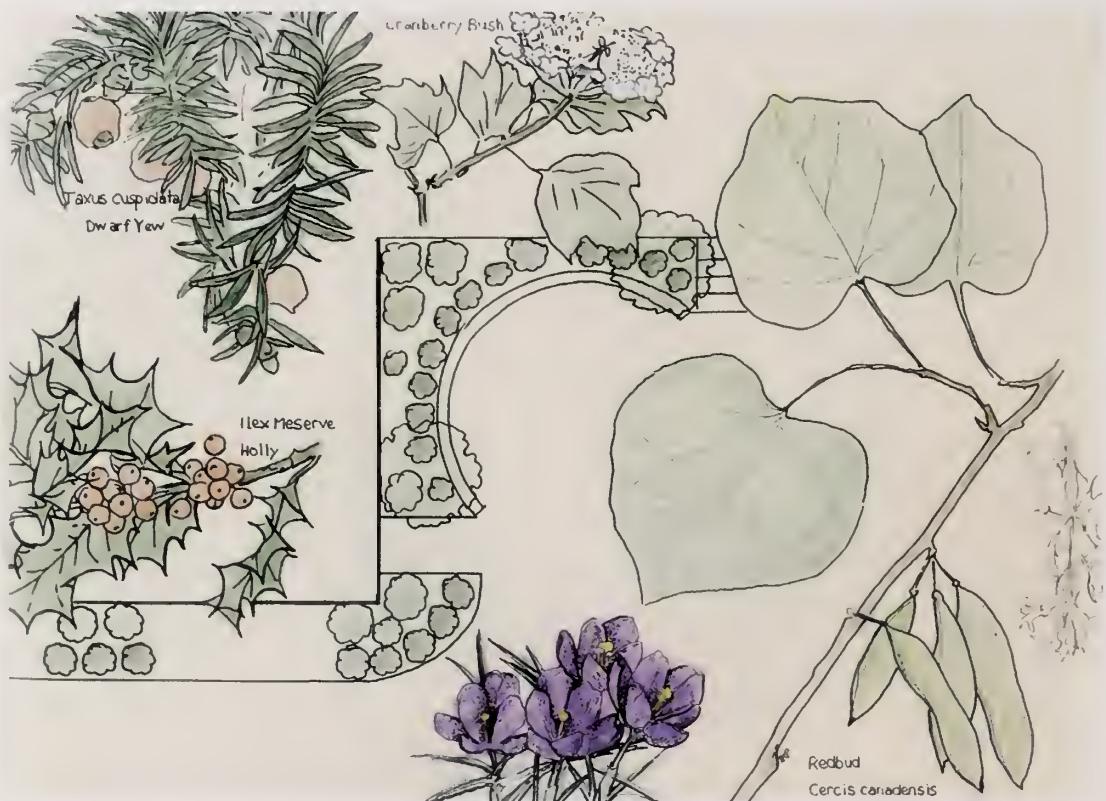


*"The playground needs to provide active and passive recreation for the whole community."*





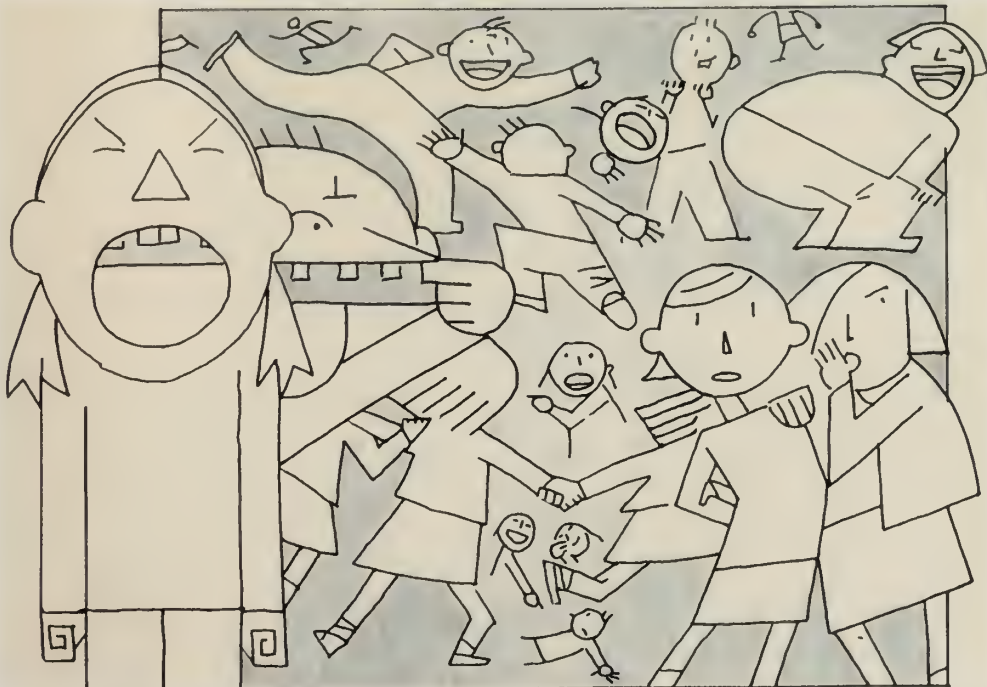
The teachers requested an outdoor classroom and a place for a garden.



The children were quite clear about what they wanted: Space for a variety of games, room to run, and special places for make-believe.



The town officials helped the community sort out all their ideas until agreement was reached. They also made sure the new playground would be safe and accessible to all.

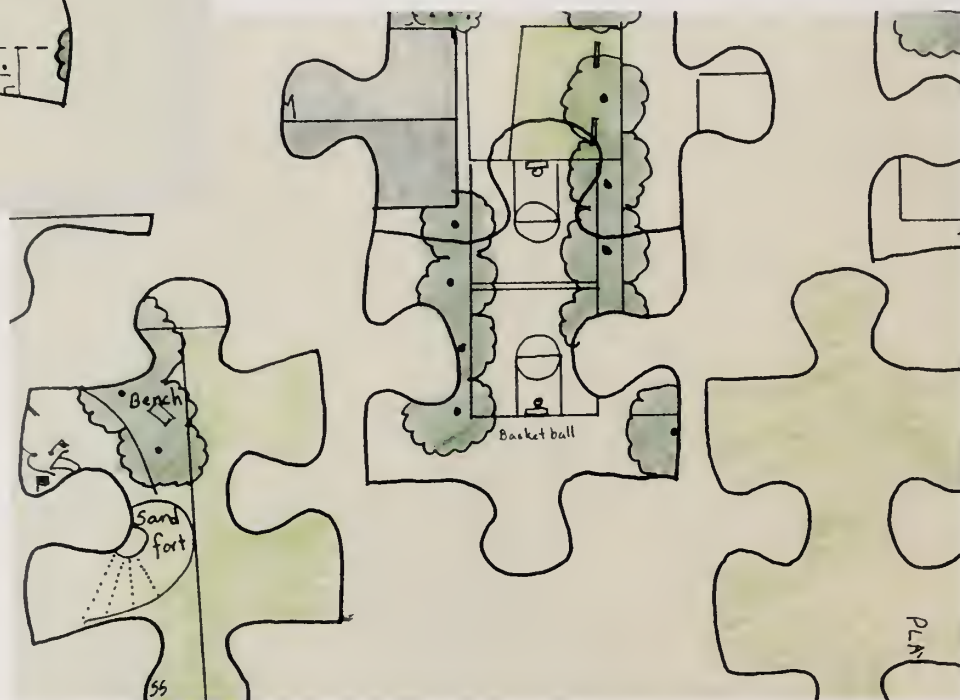
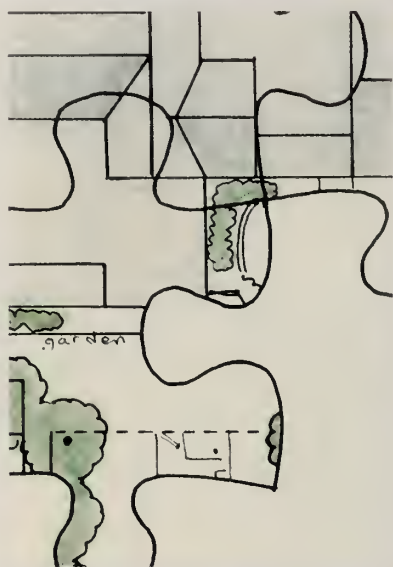






To fit all these pieces together and to resolve conflicts as they arose were the challenges the designer had to meet.

Finding a solution for multiple uses in such tiny places is no easy feat.





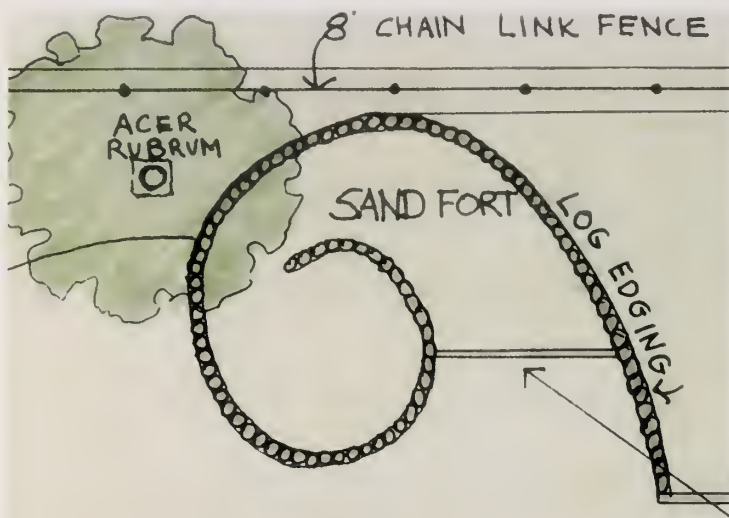
The plans were drawn up and presented. Then even more meetings took place. Many details still needed to be worked out.

Picnic tables and benches placed in the shade provide quiet places for checkers and relaxation.

A giant map of the U.S.A. painted onto the blacktop puts geography right underfoot.







When every detail was worked out and approved, including places for a water fountain, sand fort, and ginkgo tree, the drawings were finally finished.

Then a builder was chosen to buy all the materials, hire the workers, schedule demolition, begin new construction, and even roll out the new grass.

During renovation the playground was closed and off limits. The children watched with anticipation while construction proceeded, anxious to return to their games.



Finally there was reason for celebration. The playground is well planned and rebuilt. This little jewel is now safe and attractive and with care will provide a place for every kind of recreation for this generation . . . and maybe the next.

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*Mary Dennis received the certificate for landscape design in 1993. She participated throughout the entire planning, design, and construction of the Driscoll School playground. John Furlong was the project landscape architect.*







# PRIVATE PLEASURES DERIVED FROM TRADITION

*The Hunnewell Estates Historic District*

*Allyson M. Hayward*

When I set out to select a topic for my independent project in landscape design history, the gardens of Wellesley, Massachusetts, seemed an obvious choice. Having lived in the town for almost twenty years and served as president of one of the local garden clubs, I believed that a historical survey of its gardens would be of use to scholars as well as to the community. I hoped to find examples of landscapes representing a variety of styles, and my initial foray was suc-

cessful. Early in my research, however, it became clear that many of the historically significant gardens in Wellesley belonged to a single, very large family. So after putting aside the preliminary work on other gardens, I focused on the properties of Horatio Hollis Hunnewell and his talented children, who gave so much to the town of Wellesley.

The most familiar image of the famous landscapes built by the Horatio Hollis Hunnewell family shows Italianate topiary casting precise shadows across terraces that rise above the waters of Lake Waban in Wellesley, Massachusetts. This image, however, represents only one of more than a dozen contiguous Hunnewell family estates that the Hunnewells developed in the latter half of the nineteenth century. By 1900 these properties comprised several hundred acres and included not only the estate called Wellesley, with its terraced topiary garden, but also The Cottage, The Oaks, Hill Hurst, The Cedars, the Welles-Richardson Estate, the Welles-Kimball Farm, the Morrill Estate, the Walter Hunnewell Estate, The Pines, the Winn House, and the Souchard House—all of them funded by the great wealth amassed by the Hunnewell family in banking, railroads, copper mines, and other industrial enterprises all over the United States during the years of America's westward expansion after the Civil War.

*Clockwise from top:*

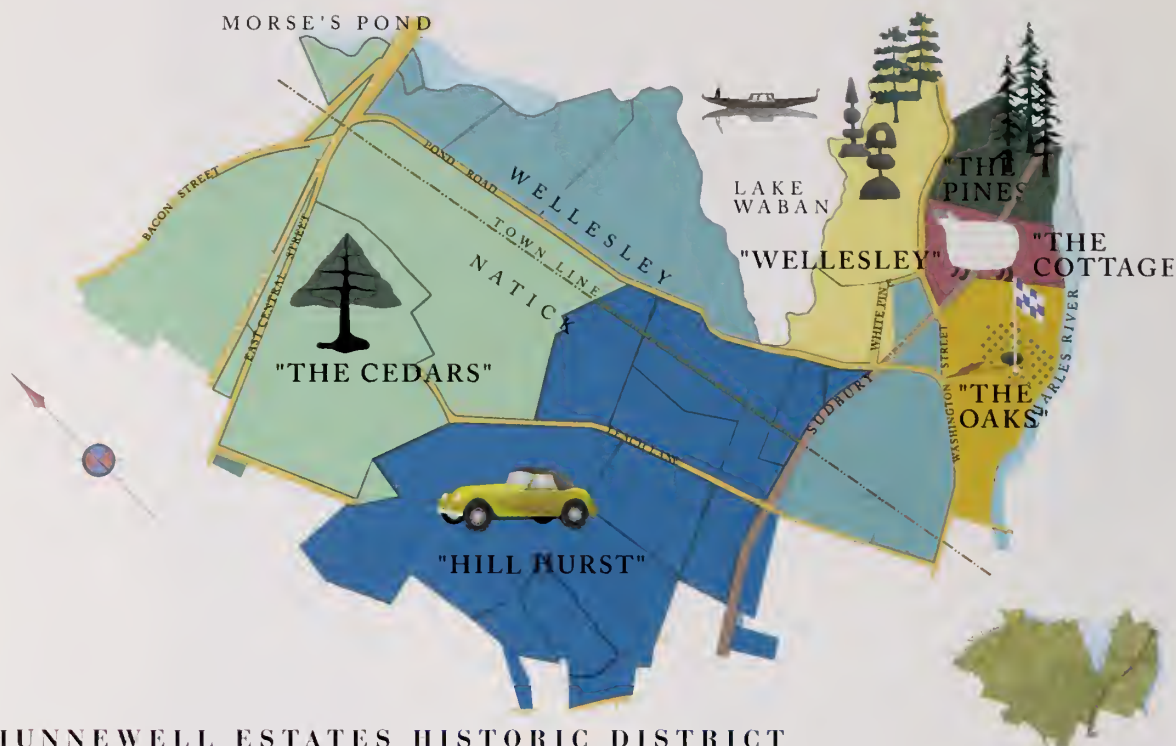
*H. H. Hunnewell's Italian Garden and boathouse. The terraces were planted on a three-acre bank, using the space in an interesting manner while leaving the view of the lake uncluttered. Undated photograph courtesy of Wellesley, Hunnewell Family Archives.*

*When Henry S. Hunnewell was not tending to his own beautiful estate, The Cedars, he could be found at The Oaks playing golf, a game he loved and often wrote about in his journals. Undated photograph courtesy of The Cedars, Henry S. Hunnewell Family Archives.*

*The Pinetum, a nine-acre collection started in 1866, of more than four hundred conifers from all over the world. Undated photograph from Life, Letters and Diary of Horatio Hollis Hunnewell, courtesy of Wellesley, Hunnewell Family Archives*

*Horatio Hollis Hunnewell with his secateurs at the end of a workday, enjoying his view of Lake Waban. Undated photograph courtesy of Wellesley, Hunnewell Family Archives.*





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Graphic by the author, 1997

## HUNNEWELL ESTATES HISTORIC DISTRICT

Today most of these properties make up the Hunnewell Estates Historic District in the southwestern corner of the town of Wellesley, twelve miles west of Boston. The town, like the principal estate in the Hunnewell District, takes its name from Horatio Hollis Hunnewell's wife, Isabella Pratt Welles (1812–1888). Formerly known as West Needham, it was incorporated as Wellesley in 1881. Most of the estates lie on a relatively flat river plain between the Charles River and Lake Waban within the town of Wellesley; those that extend into neighboring Natick enjoy more varied topography, with commanding views of the lake, hills, meadows, and river plain. The Hunnewell Estates Historic District, listed on the National Register of Historic Places in 1988, is still largely owned and occupied by members of the Hunnewell family. Only one of the properties—the Pines, now owned by Wellesley College and housing its Women's Research Center—has passed out of family ownership. Four properties are of particular historical interest: Wellesley, the origi-

nal estate and the centerpiece of the District; The Cottage, a property key to the development of the District; The Oaks, with the first documented private golf course in New England; and The Cedars, an extraordinary landscape with rolling lawns and vistas designed by Charles Eliot.

### Horatio Hollis Hunnewell

H. H. Hunnewell, the family patriarch, was born in Watertown, Massachusetts, in 1810. At the age of fifteen he was sent to Paris to learn banking in the house of Welles and Company. In 1937, he married Isabella Pratt Welles, the daughter of John Welles, one of the firm's partners. Soon afterwards the couple returned to the United States and purchased a residence on Boston's Beacon Hill.

Like John Claudius Loudon and Andrew Jackson Downing before him, Hunnewell believed that "nature was beneficial for everyone and making a garden was socially valuable." They all agreed, in Hunnewell's words,



Courtesy Wellesley Historical Society

Horatio Hollis Hunnewell lived a full life. A generous man, he believed in family unity, public duty, and horticultural beauty. Undated.

"[that] human behavior was greatly affected by the environment and that gardening was a civilized and healthful activity." An 1843 note in Hunnewell's diary reads simply, "Became interested in country life." In that year he and his wife purchased a large plot of land next to a modest cottage owned by his father-in-law in West Needham. In 1844 Hunnewell initiated the construction of a Renaissance Revival mansion designed by Arthur Gilman, at the same time clearing the land, building stone walls, and laying out the initial plans for his famous gardens. Like other couples of their wealth and status at the time, the Hunnewells drew inspiration for their splendid home from the old-world architecture and landscapes seen on their many trips abroad. These properties were designed to reflect their owners' place in society, but unlike most of his peers, Horatio Hollis Hunnewell also used his estate to contribute generously to the development of ornamental gardening in New England.

The Hunnewells produced nine children, seven of whom built homes on properties contiguous to their parents'. The estates reflected

not only the values that H. H. Hunnewell instilled in his family, but also the tastes of the emerging leisure class throughout the United States, especially in New England and New York State. Many of the properties, for example, included greenhouses and plantations for horticultural experimentation. H. H. Hunnewell himself gained national recognition for his experiments with trees—especially conifers—and with other woody plants, notably the rhododendrons that he introduced into New England. Nurserymen traveled from as far as England to see his gardens. Through public exhibits mounted by the Massachusetts Horticultural Society, plants from the family's estates served as an educational resource, and H. H. Hunnewell enjoyed hosting plant hunters and landscape architects as well as nurserymen, inspiring all who took an interest in coniferous and broad-leaved evergreens. The properties themselves, with their innovative facilities for sports and leisure activities, their sophisticated animal husbandry, and their extensive landscape gardening, were often featured in the influential literature of the day, including A. J. Downing's *Treatise* and the magazine *Garden and Forest*.

Horatio Hollis Hunnewell fostered in his children a sense of community and public spirit, a solid work ethic, and a commitment to wise stewardship of their land, setting a strong example by employing his wealth, his knowledge of horticulture, and his down-to-earth personal style for the benefit of many organizations. He was a supporter of the botanical department of Harvard University, a contributor to the Botanic Garden and Museum in Cambridge, and one of the largest benefactors of the Arnold Arboretum, where the Hunnewell Building still stands. He endowed a chair in the botanical department at Wellesley College, served as a trustee of the Massachusetts Humane Society for twenty-six years, and was a director of the Massachusetts Horticultural Society for more than thirty-four years.

In 1869, on the occasion of the Massachusetts Horticultural Society's fortieth annual exhibition, he established the Hunnewell Award, consisting of annual prizes of \$40 to \$160 bestowed





Courtesy Alex MacLean, Landslides, May 1997

*Overview of Wellesley with the Italian Garden and Pavilion in lower left portion of the photograph. The greenhouses and service buildings are located in the upper right.*

for "grounds laid out with the most taste, planted most judiciously, and kept in the best order for three successive years." The awards gave prestige and a lasting stimulus to ornamental horticulture in New England.

## Wellesley

In 1852 Horatio and Isabella Hunnewell moved into their new house, which they named Wellesley. Many large and lavish estates were built throughout the United States at this time, but few in New England could compare with Wellesley in taste, grandeur, and the liberal expenditure of money. Spread over forty acres on the eastern shore of Lake Waban, it remains the central component of the Hunnewell Estates Historic District.

Although Hunnewell was his own landscape designer and helped work his own land, he often sought the advice of horticulturally talented friends, including the Arnold Arboretum's first director, Charles Sprague Sargent, Henry Winthrop Sargent (a cousin of Isabella Hunnewell), and his own principal gardeners, F. L. Harris and T. D. Hatfield. The Wellesley garden, laid out east-west along the southern shore of Lake Waban, comprised a series of separate areas, each with a distinctive design and

its own palette of plants: the Pinetum in the easternmost corner, the Italian Garden along the lakeshore, a formal French parterre extending from the back of the house toward the lake, and an extensive rhododendron and azalea garden tucked away on the outermost edge of The Great Lawn. Near the Pinetum, Hunnewell later added more gardens of rhododendron and azalea, 1876 and 1879, respectively.

The juxtaposition of exotics and native trees, and of natural and constructed forms, reflected the fashions of the time. Rhododendrons imported from China, for example, were planted as a large informal garden along an avenue leading to the Italian Garden, where fancifully clipped conifers were arranged on terraces designed to conform to existing topog-



Courtesy Wellesley, Hunnewell Family Archives

*H. H. Hunnewell offering direction and advice to the workmen building terraces for the Italian Garden, c. 1890.*

raphy. In the Pinetum native trees mingled with conifers that Hunnewell imported from all over the world, making it internationally famous as one of the most comprehensive collections in the United States prior to the establishment of the Arnold Arboretum in 1872. Fittingly, a cultivar of one of his introductions, *Picea pungens*, was named 'Hunnewelliana'.

Among the outbuildings clustered to the west of the house are numerous greenhouses for propagation and experimentation. The first was built in May of 1852 as a grapery. By 1895 he was experimenting under glass with peaches, hollies, rhododendrons, azaleas, palms, and oranges. A pit house was used to store tender rhododendrons during the winter.

The inspiration for the sumptuous Italian Garden was a visit to Elvaston Castle in Derbyshire, where he saw an English interpretation of the delights and grandeur of the great Italian gardens. Its centerpiece was a topiary collection surrounded by an arboretum of coniferous trees. "It was . . . after a visit to Elvaston Castle, that I conceived the idea of making a collection of evergreen trees for topiary work in imitation of what I witnessed on that celebrated estate," Hunnewell later wrote. In 1850–1851, he began creating his own Italian garden on seven terraces that descended from a ridge seventy-five feet above Lake Waban to its shores, covering about three acres. His choice of trees reflected the harsh New England climate; the English yews so magnificently trained at Elvaston would never survive the cold Massachusetts winters, so instead he used white pine, spruce, hemlock, cedar, and arborvitae.

To add to the illusion of a classic Italian scene, Hunnewell purchased a gondola and constructed a boathouse along the shores of the lake. This idea may have been sparked by a



*Hunnewell's gondola on Lake Waban with a view of Italian Garden at Wellesley, undated.*

Seaver Photo, West Newton, MA, courtesy Hill Hurst, Hollis Hunnewell Family Archives

trip to Bellagio, on Lake Como, where he also borrowed ideas from the gardens of Villa Serbelloni and Villa Melzi. Disregarding the unpretentious style favored in New England, Hunnewell entertained his friends and family on Lake Waban, a gondolier skillfully gliding across the waters, guiding the boat to within view of the Italian Garden, just as if he were plying the waters of Lake Como.

To the east of the Italian Garden lies the nine-acre Pinetum with its collection of more than four hundred conifers from throughout the world, the first planted in 1866. The care that has gone into building this privately owned arboretum over the past one hundred and forty years has resulted in many new plant varieties, some widely used throughout the northern United States today. The Pinetum remains the central feature of the Wellesley landscape, increasing in area and number of species with each new Hunnewell generation.

Any discussion of the Hunnewell horticultural legacy would be incomplete without a mention of Theophilus D. Hatfield, the gardener who served the Hunnewell family for thirty-seven years. Hunnewell afforded Hatfield the resources to carry out years of hybridizing and experimentation, while Hatfield provided a broad knowledge of the required nursery practices. Born in England in 1856, Hatfield graduated from Kew College and went on to practice



on private estates. In 1883 he sailed to the United States, where he first worked in a New Jersey nursery. In 1884 he was hired as estate manager by Horatio Hollis Hunnewell's eldest son, Walter, and in 1890 he took charge of Wellesley.

Hatfield and Hunnewell experimented with hybridizing chrysanthemums, begonias, and, especially, azaleas and rhododendrons. Hatfield attributed his introduction to rhododendron to a gift of a *Rhododendron japonicum* from Jackson Thornton Dawson, the Arnold Arboretum's first propagator and a Hunnewell family friend. Hatfield later crossed that plant with *Rhododendron molle*, producing the first authentic crosses between the Japanese and Chinese species. (He named a dark orange variety "Miss Louisa Hunnewell" for H. H. Hunnewell's daughter.)

Hatfield is best known today for a hardy yew cultivar he developed while working for the Hunnewells. Crossing the English yew, *Taxus baccata*, with the Japanese yew, *T. cuspidata*, for the latter's hardiness, he produced *Taxus x media*, meaning "in between." An excellent cultivar, *T. x media* 'Hatfieldii', a dense, pyramidal form with dark green leaves, is used extensively for hedging, screening, and other mass plantings. Hatfield lived on the Hunnewell estate until his death in 1929.

## The Cottage

Across the street from Wellesley lies The Cottage, the second estate built by the Hunnewell family. Hunnewell chose the site for its proximity to Wellesley, revealing his desire to keep the family together. On July 25, 1870, he noted in his diary, "Commenced digging cellar. This is for the use of any of the members of the family who, it is hoped, may be tempted to occupy it." The Cottage served as a convenience, a temporary lodging for the Hunnewell children while they were building their own homes nearby. As such, it was key to the development of the District: without this "spare" house located so close to their own new construction, one or more of the children might have chosen to build elsewhere. From its construction in 1870 until Hunnewell's death in 1902, many relatives took up residence on an interim basis.

The original estate consisted of about six acres. Hunnewell employed a friend, the architect John Hubbard Sturgis, to build a Queen Anne-style home of stone, wood, and stucco. In 1923 when Hunnewell's unmarried daughter, Louisa, took up permanent residence, she hired Henry V. Hubbard and Percival Gallagher of the Olmsted Brothers firm to redesign the entrance driveway and plantings and to add a naturalistic pool, new stone, brick, and stucco boundary walls along Washington Street, and various terraces and garden beds around the house and grounds.

## The Oaks

In the westernmost section of the Hunnewell Estates Historic District is The Oaks, built for Arthur, the sixth child of H. H. Hunnewell, and his wife, Jane Hubbard Boit. Begun in 1871, the estate originally consisted of forty-one acres of level, river-plain pasture abutted by the Charles River, Washington Street, and the property today known as Elm Bank.

Arthur Hunnewell, an active member of the Massachusetts Horticultural Society, had a passion for



Courtesy, National Park Service, Frederick Law Olmsted National Historic Site.

*The Cottage, showing the new entry driveway, c. 1934.*



Courtesy Wellesley, Hunnewell Family Archives

Arthur Hunnewell, the sixth child of Horatio Hollis Hunnewell, undated photograph from *Life, Letters and Diary of Horatio Hollis Hunnewell*.

hybridizing and exhibiting chrysanthemums; he produced around twenty-five new varieties in his greenhouses. An avid sports enthusiast as well, he combined landscape gardening with his love of athletics by building the first documented private golf course in New England on his property. In 1892 Florence Boit, Jane Hunnewell's niece, spent the summer at the Oaks. Enthusiastic about golf and armed with a set of clubs acquired while on vacation in France, she introduced her uncle Arthur and his friends to the sport. He and his brothers soon set out to construct a six-hole golf course on the grounds of

The Oaks, assisted by Arthur's estate superintendent, Frederick Coles, and supervised by Florence Boit.

The course crisscrossed the property and encircled the one-room schoolhouse built for and used by generations of Hunnewells. Construction was relatively easy: the turf was already there, ready for scything or mowing; the flat terrain accommodated ditches and a brook; and a variety of plants added obstacles and interest.

The Hunnewell course stimulated the development of golf in New England, making this property one of exceptional historical importance. Within six months friends and fellow club members were so quickly and completely won over by the new sport that they recommended that golf be given a trial at The Country Club in Brookline. The proposal was approved in November of 1892, with Arthur Hunnewell and his friends Laurence Curtis and Robert Bacon named to supervise the project. The following year, in March of 1893, a six-hole course was constructed and soon expanded to nine holes. By 1900 twenty-nine clubs had been built within a twelve-mile radius of Boston, and in the ensuing years the sport blossomed throughout New England on courses that still exist today. Private courses, while not common, became one of the pleasures of industrial



Courtesy Wellesley, Hunnewell Family Archives

The Oaks golf course, second hole. From left to right, Gertrude Hunnewell bending over her putt, with Robert Gould Shaw, Arthur Hunnewell, Jane Boit Hunnewell, and Francis Williams Sargent looking on, 1901.





Courtesy The Cedars, Henry S. Hunnewell Family Archives

*Henry Sargent Hunnewell sporting his distinctive and ever-present mustache, 1902.*

giants of the Country Place era such as Vanderbilt, Rockefeller, and DuPont.

## The Cedars

To the north and west of the District, along the Natick town line, lies The Cedars, the summer home of the ninth and youngest child of Horatio Hollis Hunnewell, Henry Sargent Hunnewell. Like his father, Henry was intensely interested in the aesthetic aspects of landscape gardening and estate development and sought to preserve the natural beauty of the rolling hills and woodlands of his property. The original 1888 purchase consisted of about 248 acres along Pond Road and East Central Street in Wellesley and Natick. Within ten years, however, Henry had increased his holdings to more than five hundred acres by systematically acquiring adjacent farms and woodlots.

Charles Eliot, best known for conceiving The Trustees of Reservations and planning the Boston Metropolitan Park System, was the landscape architect for the estate. He died in 1897, before the estate was complete, but had a major influence on the siting of the house and stable and on the location and layout of the main avenue, the vistas, and the garden beds. Until the time of his death, Eliot visited the estate often to provide consultation to Hunnewell. Olmsted himself offered advice on the siting of the main avenue; Charles Sprague Sargent visited the estate often and gave horticultural and design suggestions; and Jackson Dawson supplied many woody plants. In fact, numerous journal entries in the Hunnewell archives document the hundreds of trees that were sent from the Arnold Arboretum to The Cedars and other Hunnewell properties for trial.

The main organizing element in The Cedars' landscape is a series of vistas radiating from the house in four directions. Typical of the large estates of the Country Place era, these vistas form dramatic visual links to the lakes and woods beyond. The primary view is to the south, down the main front lawn.



Courtesy The Cedars, Hunnewell Family Archives

*Aerial view of The Cedars, undated. A fine example of the visual links from the main house to the lakes and woodlands of the surrounding landscape.*

Hunnewell, working with Charles Eliot, reinforced the vistas using the textural contrast of cedars to define the edges of the maple and swamp oak woods. The "cedars" that formed picturesque-styled belts, important focal points, and triangles that demarcated the vistas included *Cedrus atlantica* (Atlas cedar), *C. libani* (cedar of Lebanon), and *C. deodara* (deodar cedar), but also others not of the genre *Cedrus*: for instance, *Chamaecyparis thyoides* (Atlantic white cedar), *Thuja occidentalis* (American arborvitae or white cedar), and *Juniperus virginiana* (eastern red cedar).

Harriett Risley Foote, a nationally known rosarian during the golden age of American gardens (1890–1940), designed and laid out the estate's rose garden, which won a Massachusetts Horticultural Society Gold Medal in 1923. The rose garden, like the perennial garden, was not situated near the house but off in the woods, to be enjoyed by visitors while strolling the estate. Expanses of immaculate lawn were outlined by trees or shrubs, with statuary positioned as focal points in the center of the rose garden and at the entrances to the gardens. The liberal use of evergreens, both broad-leaved and coniferous, provided year-round interest. Henry also introduced utilitarian agriculture to the estate—vegetable gardens, an orchard, a few dairy cows, chickens, pigs, and—to support his favorite pastimes of riding and racing—horses.

### Postscript

While other wealthy families in the United States were also building domestic empires at this time, none amassed so many large, contiguous estates. The Hunnewell Estates Historic District is a rare example of several contiguous landscapes passing from one generation to the next with each successive owner building on the work of his predecessor. This arrangement is even more unusual in that the land was not originally owned by one family member and then deeded to the sons and daughters. Instead, through a carefully planned sequence of acquisitions, each son or daughter added to his or her own property, thereby

extending the District and wrapping it around the lake.

Horatio Hollis Hunnewell set out in 1843 to create a beautiful estate, but in involving himself in horticulture it became a setting where he shared his knowledge—and his passion for his favorite plants—with the public. When he started the collection of broad-leaved evergreens, it was generally thought that few, if any, choice rhododendrons and azaleas would thrive so far north, but by persisting over many years he demonstrated that hundreds of varieties could grow outdoors in New England. His Pinetum, too, the first comprehensive collection of its kind, became an educational force and an inspiration to all in America with an interest in conifers.

Today, the properties still encircle Lake Waban, presenting a pristine landscape in the midst of metropolitan Boston's bustle and revealing intriguing layers of New England's garden history. With their statements about the power that culture and wealth can wield when used for education and social good, the Hunnewell gardens record late-nineteenth and early-twentieth-century New England society at its best. A quote from an 1857 historical sketch of the Massachusetts Society for the Promotion of Agriculture (of which H. H. Hunnewell's youngest son, Henry, was an active supporter) also aptly describes the Hunnewells: "[T]hey were gentlemen of the highest standing in the country, distinguished for their wealth, their learning, and their public and private virtues . . . wealth as well as knowledge is power."

Facing the long-term care of their properties, the Hunnewells, who have a strong sense of family heritage, are in the process of preserving them for future generations. Hundreds of acres have been placed under conservation restrictions with The Trustees of Reservations and the Commonwealth of Massachusetts. H. H. Hunnewell's Pinetum, the Italian Garden, and the shoreline along Lake Waban have been protected from development. The Italian Garden will remain as open land, not reverting to forest, and the seven-tiered terraces are to be maintained.



## References

Horatio Hollis Hunnewell, *Life, Letters and Diary of Horatio Hollis Hunnewell: With A Short History of the Hunnewell and Welles Families and An Account of the Wellesley and Natick Estates*, vols. 1, II, III (Boston: Privately printed, 1906).

The children of Horatio Hollis Hunnewell (1810–1902) and Isabella Pratt Welles Hunnewell (1812–1888) were: Hollis Horatio Hunnewell (1836–1884), Francis Welles Hunnewell (1838–1917), John Welles Hunnewell (1840–1909), Susan Hunnewell (1842–1842), Walter Hunnewell (1844–1921), Arthur Hunnewell (1845–1904), Isabella Pratt Hunnewell Shaw (1849–1934), Jane Welles Hunnewell Sargent (1851–1936), Henry Sargent Hunnewell (1854–1931). Susan died in infancy. John, who spent most of his life in Paris, was the only other offspring of H. H. Hunnewell not to build in the District.

Albert Emerson Benson, *History of the Massachusetts Horticultural Society* (Boston: Massachusetts Horticultural Society, 1929), 158.

Hunnewell's youngest son wrote, "I was named for Henry Sargent, cousin of my mother and a very intimate horticultural friend of my father." Henry S. Hunnewell, *Recollections of Henry Sargent Hunnewell* (Boston: Privately Printed, 1938), 3.

H. H. Hunnewell, *Life, Letters and Diary*, 101.

From Donald Wyman, "The Hunnewell Arboretum, 1852–1952," *Arnoldia* 12(9–12): 61–84, which includes Hatfield's 1928 list of hardy rhododendrons. Wyman also includes "a few" of the Hunnewell Arboretum's woody plants, 1852–1952.

Undated, unsigned document, Hunnewell Family Archives, 1850–1997, Wellesley, MA.

H. H. Hunnewell, *Life, Letters and Diary*, 199–200: "From

1873–75, at different periods, the Cottage was occupied by Mr. and Mrs. Arthur Hunnewell, Mr. and Mrs. Hollis Hunnewell and Mr. and Mrs. Francis W. Hunnewell. In 1875 it became the property of Mr. and Mrs. R. G. Shaw . . . In 1882, Mr. and Mrs. F. W. Sargent occupied the house . . . In 1891 Mr. and Mrs. Arthur Hunnewell spent the summer there . . ."

Olmsted Job No. 7215, Francis W. Hunnewell, Wellesley, MA, June 1923–April 1939. National Park Service, Frederick Law Olmsted National Historic Site, Brookline, MA.

For a more complete history of The Cedars, see Allyson M. Hayward, "A Rather Wild and Picturesque Place: Henry Sargent Hunnewell at The Cedars," *Journal of the New England History Society* 6 (1998): 1–13.

The Henry S. Hunnewell Horticultural Journals and Plant Lists, 1881–1900 (Hunnewell Family Archives, The Cedars, Natick, MA).

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*Upon earning a certificate in landscape design history in 1997, Allyson received the Outstanding Student Faculty Award in her class. Since then, she has been awarded a Gold Medal from the Massachusetts Horticultural Society for promoting New England's garden history, served as chair of the New England Garden History Society, and is currently a member of the landscape advisory committee for Historic New England (formerly SPNEA) and president of the New England Farm and Garden Association, Inc. She lectures extensively and her book on the life and gardens of British garden designer Norah Lindsay (1873–1948) will be published in 2007. She will soon revisit her initial research on the Hunnewell estates with a book in mind.*

# THE PILGRIMAGE OF THE GROVES

## *Reconstructing the Meaning of a Sixteenth-Century Hindu Landscape*

Behula Shah

*This article summarizes the results of an effort to discover the relationship between the landscape in a region called Vraj, in north central India, and the religious and political climate that existed at the time the landscape became enclosed by an extended pilgrimage route. At that point the area enclosed by the longer route became known as Braj. Located along the Yamuna (Jumna) River between Delhi and Agra, Braj encompasses the ancient city of Mathura and its surrounding countryside, an area of 35 square miles.*

### The Cultural Landscape of Mathura

No history of northern India can exclude a discussion of the contribution of this region to the molding of Indian consciousness. By the first few centuries of the current era, Mathura had already acquired the status of an important economic, cultural, and political center; it is no exaggeration to say that every significant political and religious influence on the development of Indian civilization was in some way related to Mathura and its environs. In particular, the city has been an important destination for Hindu pilgrimage for at least the last ten centuries, and the physical landscape of the region has been closely associated with the myth of Krishna, one of the most popular Hindu deities and mythological figures, ever since the emergence of the myth two thousand years ago.

Krishna (meaning "dark-colored lord") is one of ten avatars (incarnations) of Vishnu, the sustainer of all life and nature. All Vishnu's avatars personified aspects of the idea of sustaining life on Earth, which might be framed today as stewardship or environmentalism. Krishna grew up among the herdsmen of Vraj (one meaning of which is "cattle shed"), and he was himself a cowherd. (As in Greek and Persian, the Sanskrit word for cow [Go] also

means earth.") This is the mythical landscape where Krishna was born and spent his early childhood and amorous adolescence.

In the sixteenth century, when Vraj was renamed Braj, the area became an even more important locus for the cult of Krishna. The purpose of my study was to uncover the reasons for this development and the role that this sacred landscape played in asserting political as well as religious authority in the area.

### Mathura in the Sixteenth Century

Because of its geographic and cultural importance, Mathura was the focus of attack when the first Muslim invasions of northern India took place in the eleventh century. By the twelfth century Mathura and its environs had been absorbed into the territory controlled by the Muslim dynasties of India, collectively known as the Delhi Sultanate.

At the beginning of the sixteenth century, one of the sultanate's last powerful rulers, Sikandar Lodi (1488–1517), consolidated his hold on the region when he moved his capital from Delhi to Agra, much closer to Mathura. A road that he built to connect Agra to Delhi ran through the heart of Mathura, severely disrupting the traditional Hindu pilgrimages. Furthermore, his forces desecrated and



destroyed its important temples, an affront to Hindu freedom of worship in a city that symbolized Hindu religion and culture.

The Hindus, however, were not willing to surrender their attachment to Mathura; indeed, one result of this new incursion was to shift even more devotional activities to the region. Hindu poet-seers (a "seer"—*drashta* in Sanskrit—has free access to the past, the present, and the future, and his poetry has the divine power of universal appeal) began to settle in the area, where they elevated Krishna's status as the predominant deity in this Muslim-controlled territory. The mechanism they used to achieve this was a new pilgrimage, the Pilgrimage of the Groves.

### **Transforming the Landscape into a Sacred Pilgrimage Route**

The ritual of the Pilgrimage of the Groves was codified in 1552 in a Sanskrit text, *Vraj Bhakti Vilasa*, written by Narayan Bhatt, one of the poet-seers. This text became the major instrument for expanding and elaborating the traditional mythology of Krishna. It was my primary source for interpreting the meaning of the landscape of Braj and—in the absence of contemporary descriptions—for constructing a model of its sixteenth-century form.

The *Vraj Bhakti Vilasa* metaphorically inscribed the Krishna myth on the landscape of the region, to which the poet-seers now gave the name Braj. Every feature—hills, woodland, groves, ponds and pools, the Yamuna River—became associated with episodes from the Krishna myth. This new symbolic significance was reinforced by a new pilgrimage path. Mathura itself was no longer the central pilgrimage destination that it had traditionally been; instead, a new and circuitous route extended the pilgrimage beyond the city into the surrounding natural landscape. Important sites along this pilgrimage path were marked by groves, each one representing a deity or deities that played a role in the Krishna narrative. The poet-seers prescribed rituals for worshipping the deities at each site, all of them clearly elaborated in Narayan Bhatt's text.

Thus was established the Pilgrimage of the Groves.

I would argue that the Braj landscape served as the medium through which the Hindus contested the Muslim presence in the land that had traditionally been an important religious and cultural center for them. By restructuring the landscape metaphorically and infusing it with new meaning, the Hindus were able to assert their claim on the land without directly confronting the ruling Muslim elite. In effect, the poet-seers used the spiritual power of Krishna to repossess the region under the name they had given it, Braj. Krishna's mythical authority in the landscape, reinstated as "historical fact" through place-based narratives, legitimized the Hindu presence. This newly mythologized landscape embodied the historical, cultural, and religious perceptions of Mathura that had accumulated in the Hindu imagination over time. Instead of rebuilding the city's demolished temples, the poet-seers compensated for their loss by "building" the Krishna doctrines, and rituals into the landscape, creating an iconic landscape with all the meanings and associations of the temple.

### **The Pilgrimage of the Groves**

The pilgrims at Braj were required to visit the groves in a prescribed order, performing the proper rituals at each grove. Detailed information about some of the groves has not yet come to light, but the map includes the most significant stations, including overnight stops, along the twenty-three-day route. The rituals prescribed in the *Vraj Bhakti Vilasa* introduced specific meanings at each grove. The pilgrim incorporated the myth into his own life—and charged the landscape with sacred meaning—by engaging in the traditional actions of Hindu worship: chanting mantras according to a prescribed rhythmic structure and circumambulating the object of worship in a clockwise direction, all the while concentrating on the Krishna narrative.

Spatially, the pilgrimage path meandered as it linked the groves, tracing a closed circuit that insulated Braj from the outside. The cen-

tral area enclosed by the path remained relatively undifferentiated, implying that it had no ritual function but, rather, was intended to protect worshippers from outsiders, just as temple walls separate the place of worship from the space around it. Likewise, Hindu worshippers at a temple followed a prescribed ritual circumambulation of the temple walls.

The geometric shapes of the landscape envisioned by Narayan Bhatt were also a feature shared by Hindu temples, as was the nature symbolism underpinning both. Conceptually, the Braj landscape replicated the temple envisioned by Hindu architecture: a place where unordered, undifferentiated nature was ordered and given meaning. Unlike the temples leveled by the Shah's troops, however, this new place could not be destroyed. This buttresses the argument that the underlying reason for creating Braj was subversive: it allowed Hindu traditions to continue undetected by the ruling Muslims.

None of these changes required substantial alterations to the natural landscape. Instead, the pilgrimage path largely overlaid new meanings on existing landscape. Each grove consisted of a tree or group of trees and a water tank (cistern), both of which carried many long-standing, symbolic meanings in the Hindu culture.

Trees represented the operational forces of nature, or the creative process, and also symbolized the *axis mundi*, or cosmological center of the world. Certain trees and groves were thought to be inhabited and guarded by *Yakshas*, or tree spirits, who personified the genius of the place and bestowed fecundity and wealth on devotees. As for water, in Hindu thought it is a potent purifier. Because all ritual acts begin with water, its presence was a functional necessity in a sanctified place.

Up to the end of the sixteenth century, when political circumstances changed, the poet-seers marked the landscape only with small shrines and other unobtrusive structures containing natural or found objects that had no value or meaning for the Muslims.

The Pilgrimage of the Groves had ramifications that went beyond the region of Braj and

beyond the sixteenth-century circumstances that led to its development. For the Hindu pilgrim, acts of devotion became connected to the natural landscape, with nature replacing the ostentatious icons that had traditionally served as objects of worship. While Braj never acquired a political role, the part it played in redefining and reenergizing the Hindu culture was critical in sustaining the religion in that place and time.

### Postscript

My Radcliffe Seminars independent project provided answers to some of the questions I broached regarding the relationship of one specific landscape to its surrounding Hindu culture and to political events at the time of its development. At the same time, it raised many new questions. The Hindu landscape tradition in India has not been well studied or even acknowledged in landscape design history. The much longer paper from which this article was excerpted therefore met with much interest when it was delivered at the Dumbarton Oaks Landscape Architecture Symposium in Washington, D.C., in 2002. That paper, "Braj: The Creation of Krishna's Landscape of Power and Pleasure and Its Sixteenth-Century Construction through the Pilgrimage of the Groves," will appear as a chapter in *Sacred Ritual Practices in Gardens and Landscapes: Ritual and Agency*, forthcoming from Dumbarton Oaks in early spring 2007.

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*Behula Shah received her certificate in landscape design history in 1997 and became founding director of landscape studies at Chatham College, in Pittsburgh, PA, establishing a master of arts in landscape studies and teaching courses in all aspects of landscape design. A founding member of the board of directors of The Cultural Landscape Foundation, she has also been instrumental in establishing the Landscape Records of South Western Pennsylvania Archives. She is now a landscape painter.*



# OF FANTASIES AND FOOTPATHS

*Seven Landscapes to Enjoy With Children*

*Maryann Alberts Malarkey*



**O**f *Fantasies and Footpaths* is a guide to seven public gardens and parks in eastern Massachusetts that hold special appeal for children. It gives brief histories of the sites, identifies the elements that engage children's energies and imaginations, and suggests ways for adults to share their magic with children. Sites as urban as Boston's Post Office Square Park and as rural as the Crane Estate in Ipswich are among those included. My selection was based on a review of published materials about public and semipublic parks and gardens in eastern Massachusetts, visits to candidate sites, and many interviews. I made

second visits accompanied by children to test my preliminary decisions as well as additional visits with different age groups to experience seasonal changes and special events.

For children, an appealing landscape is one where they can touch, climb, hide, run, rest, explore, and daydream. In judging a garden's appeal for children, I looked for elements such as visual beauty, fragrance, and sounds; variations in texture, temperature, and scale; and enclosures and promontories for a sense of intrigue and opportunities for playing hide-and-seek. Because children need order and predictability to feel comfortable, I also looked for repetition of forms and clearly delineated paths. And finally, I made sure that each site offered places for rest between periods of play and exploration.



*Let's go explore!*



*A chickadee sounds like . . .*

## **The Rockery at the Ipswich River Wildlife Sanctuary of the Massachusetts Audubon Society**

### ***Perkins Row, Topsfield***

Located in the northern part of the sanctuary, a quarter mile from the central buildings and parking area, the Rockery Trail begins at the north side of a cluster of buildings, crosses an open field, and descends through wooded slopes across bubbling streams and around ponds. Remember to bring birdseed: chickadees will eat from outstretched hands.

The Rockery was commissioned at the turn of the twentieth century by Thomas Proctor, a major landowner in Topsfield. In collaboration with the Arnold Arboretum's Charles Sprague Sargent and John George Jack, Proctor worked out a plan for a sizable garden in which to grow hardy North American trees. The designer, a Japanese landscape architect named Shintare Anamete, began work on the Rockery in 1902 and stayed on the site during the entire nine-year construction period, overseeing every detail. The result was a naturalistic landscape of ponds, plants, and ledges, featuring a cottage-sized structure made of boulders arranged to form tunnels, paths, and

overhangs. Explore the spaces and find the rooms that occasionally open up along the paths between the rocks.

The Rockery is an example of opposites working together in harmony: the fluidity of pond water contained by the solidity of stone; the darkness of interior spaces opening to sunlit paths; massive boulders sheltering the tiniest of blueberries; and the loftiness of a terrace overhanging the depths of the pond. Children sense the harmony and ask for return trips.





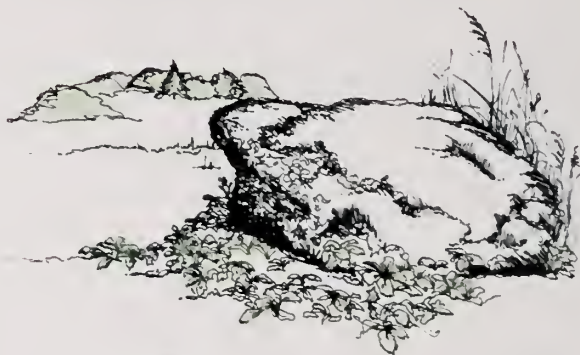
## Mytoi Gardens

### *Chappaquiddick Island, Martha's Vineyard*

Adults who arrive at Mytoi Gardens expecting to see large plants are sometimes disappointed: the three-acre, Japanese-style garden was ravaged by Hurricane Bob and an accompanying tornado in 1991, leaving only the smallest specimens. But children, because they arrive without preconceived notions, respond with



*Moss is soft. The tree is strong. Ocean breezes blow all day long.*



delight to the tiny plants surrounded by open spaces. The garden was designed in 1958 by Hugh Jones for an individual islander and later left to the care of The Trustees of Reservations.

The terrain is hilly—another appealing feature—and everything is miniature in scale: pond, island, slopes, trees, bridges, and even flowers. Children are charmed: as small as they are, they are giants next to tiny *Iris cristata*, dwarf Japanese maple, and pillow-soft moss. Older kids will be drawn to the tiny island and the red bridge leading to it; they can pretend the bridge is a ship carrying pirates to a distant land in search of long-buried riches.





*Let's pretend this is our magical kingdom.*

## Castle Hill at the Crane Estate

### *Argilla Road, Ipswich*

The Crane Estate is a multifaceted property that commands magnificent views of Gloucester, Plum Island, New Hampshire, Crane's Beach, and the Ipswich River. From the Great House on top of Castle Hill—usually called “the Castle”—you can see the ocean, forests, and estuarine marshes. It was built in 1925 by Richard T. Crane to replace the original 1910 mansion, which his wife never liked. But it is the grounds that beguile children.

Landscape construction began in 1910 when Crane commissioned the Olmsted Brothers to plan a grand allée, a swimming pool, and an Italian garden. Additional work was completed after 1925 when the Great House was built and Crane hired his neighbor, landscape architect Arthur Shurcliff, to design the drive, vegetable gardens, a bowling green, a maze, a rose garden, and an extension of the Grand Allée. Today the Bowling Green, the Grand Allée, and the Italian garden are the highlights of the built landscape.

The Bowling Green, on the east side of the Great House, is a rectangle of lawn surrounded by a low stone wall that creates a

sense of security in pleasant contrast to the unrestrained nature outside it. To find the Grand Allée, walk from the Bowling Green to the northwest side of the house, where a terrace faces the sea across a giant ribbon of lawn that unfurls from the house to the ocean. The statues that peer out from the trees bordering its crisp edges might be storybook characters for children romping down the long expanse of green.

The Italian garden, on the west side of the estate, is a sunken outdoor theater, a rectangle defined on three sides by walkways and cement walls. The fourth side is an elegant stone arbor over a path leading to the stage.

The walk to the beach from the Castle takes you down the hill on wooded trails to a boardwalk ending at a four-mile beach of white sand. The predominantly sandy ocean bottom makes for superb swimming. A beach picnic as the sun sets over the Castle is an excellent way to end the day.





## Endicott Park

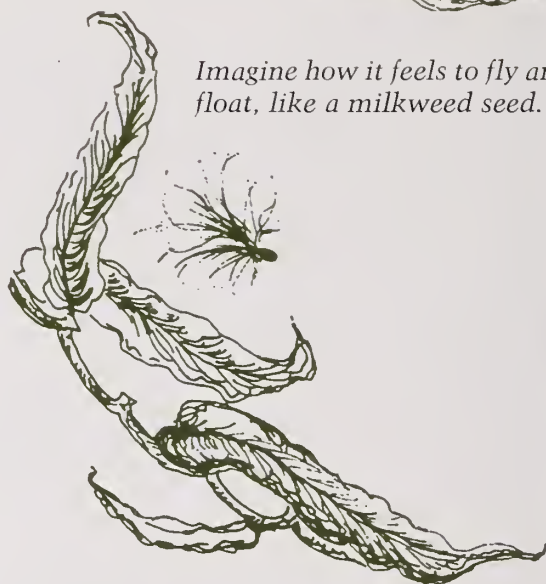
### 57 Forest Street, Danvers

If you know children who would enjoy an outing with an agricultural theme, take them to Endicott Park. Here you will find farm animals in their barn and pens; a large carriage house used for workshops, lectures, and other gatherings; and a pond with a dock. Enter from Forest Street and begin your visit by greeting the animals. Wander the complex of farm buildings, arranged to create an informal courtyard with benches and bird feeders. The novelty of the farmlike atmosphere, coupled with the pond and the meandering paths, is enhanced by the surprise of finding the children's playground—ramps, swings, towers, clubhouses, ropes, slides, hiding corners, and balconies.

But there is more: on a low hill at the end of the dirt road leading to the pond lies Glen Magna Farms, an enchanting property that offers a very different experience.



*Imagine how it feels to fly and float, like a milkweed seed.*





*What's inside? What's outside? It's time for a snack!*

## Glen Magna Farms

### *Ingersoll Street, Danvers*

In 1814 a sea captain named Joseph Peabody purchased this land as a place to hide valuable cargo from the British during the War of 1812. Today his mansion is surrounded by elaborate gardens. Walk around the house to the terrace overlooking the geometric flowerbeds. The half-circle of the first garden will guide you to the central stonedust path, which in turn leads to a gazebo where birds can be heard singing in the spruce behind.

West of the formal garden is a pergola cov-

ered by an ancient, knobby wisteria. Watch for the intriguing carvings at the top of the pergola pillars. Continuing down toward the western corner of the formal area, the path brings you to the McIntire Tea House, also called the Derby Summer House; it was built in 1793 at a farm in the neighboring town of Peabody and moved here in 1901. Just behind the teahouse, the big house garden encloses a smaller garden, one of the many subtle surprises that children are amused to discover within the formal layout.





*Many gravestones, many different pictures.*

## **Mount Auburn Cemetery**

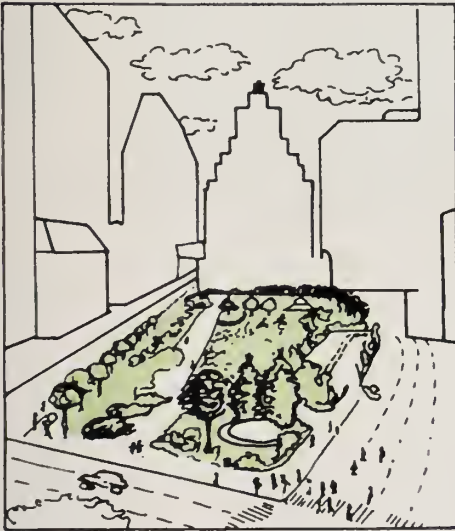
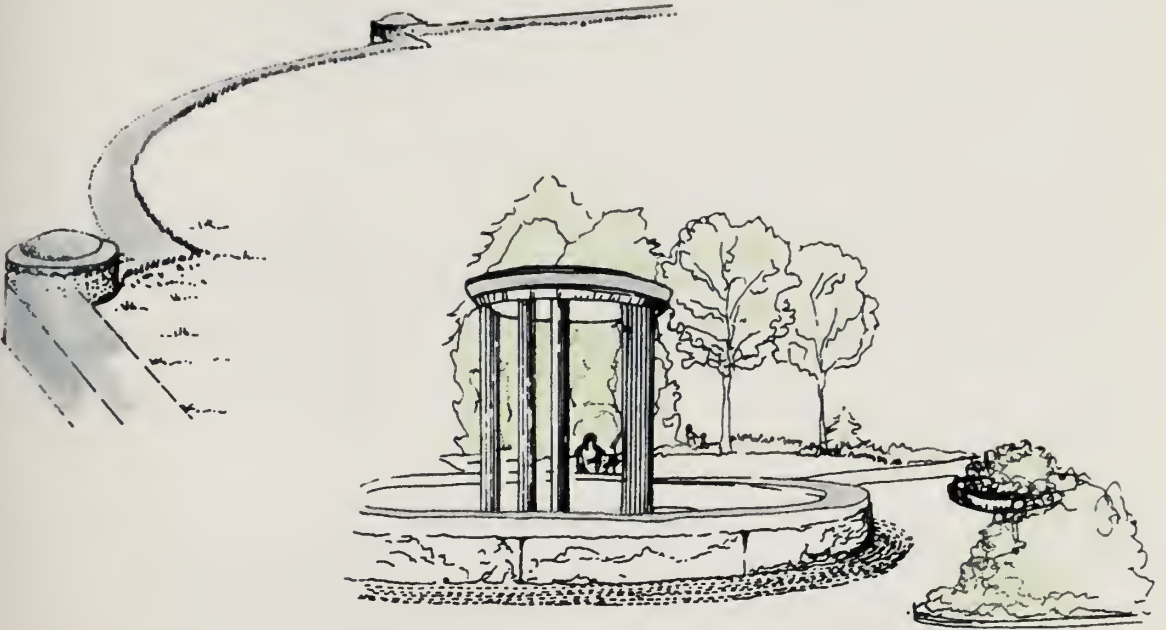
### ***580 Mount Auburn Street, Cambridge***

As America's first landscaped burial ground, created in 1831, Mount Auburn Cemetery influenced the development of public parks throughout the country. Its fascinating tapestry of natural features, eccentric monuments, and magnificent trees, together with its generous size and easy access, makes it a wonderful place to share with children.

Mount Auburn encompasses 174 acres of

well-placed plantings and more than ten miles of roads and paths that wind over its hilly topography. The landscape's complexity and its sense of enclosure bring out the curiosity in children. Rather than embarking on a prescribed walk, choose a destination and encourage diversions along the way; you may quietly discover some of the best secrets of Mount Auburn.





*How many steps does it take to walk this whole path?*

## **Post Office Square Park**

### ***Financial District, Boston***

Cars zip by, people bustle, sounds reverberate, buildings loom, and the pace of it all may be overwhelming. This is Boston's intensely energetic financial district. In its center, bounded by four streets (Congress, Franklin, Milk, and Pearl), there's a place of relative tranquility, a refuge called Post Office Square Park. The park comprises 1.7 acres of curving paths, a pedestrian arbor, pavilions, fountains, and 125 species of trees, shrubs, and perennials, all arranged on a level, open lawn under a canopy of tall trees. Two plazas are linked by a long pedestrian arcade, which serves as a backdrop to the central lawn as well as a performance area. On one of the plazas, glass pavilions house a cafe and an entrance to an underground parking garage.

A sense of relative security abides here, perhaps because of the clear sightlines. Surprises are minimal and seating is cozy. Tuck your small ones and yourself into one of the intimate seating areas between planting beds and watch the people going by or wander the paths, enjoying the flowers as you stroll.



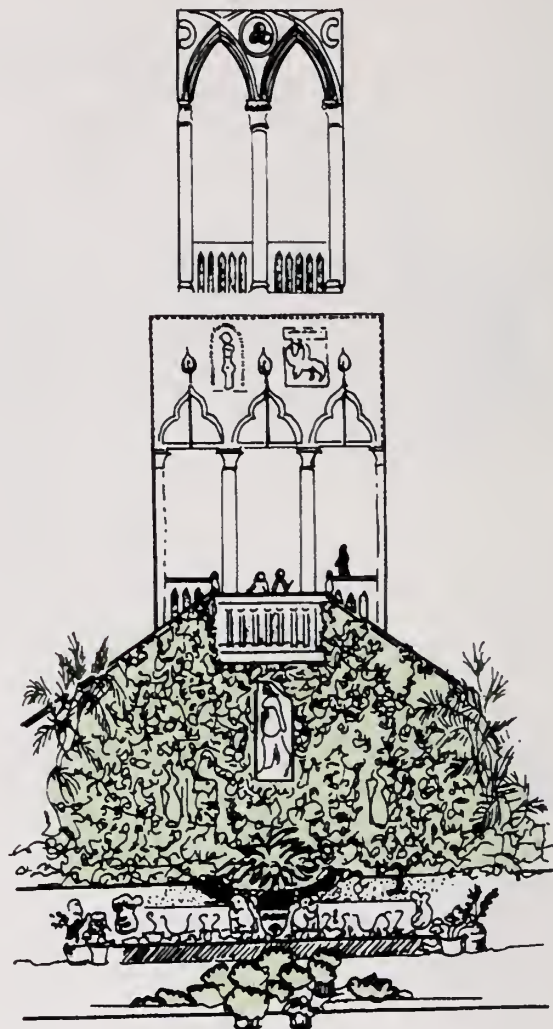
## Isabella Stewart Gardner Museum Courtyard

**280 Fenway, Boston**

Hailed as one of Boston's finest and most beloved cultural treasures, the Isabella Stewart Gardner Museum offers a unique blend of art and architecture. The art is the personal collection of Mrs. Gardner, who also conceptualized the building and created an atmosphere to "delight the senses and spark the imagination."

Begin your visit in the courtyard garden. Three stories of balconies rise above it, topped by a glass roof. The space is tall and grand—children are swept away by the view. Their eyes skip from column to statue, from fountain to arched window. They're mesmerized by the fragrance of the flowers, the sound of the gentle fountains, the soft air, and the colors of flowers cascading from arched windows.

While enjoying the courtyard, you can decide which gallery to see first. Stairs on the side will take you to the art displays on the second and third floors. Children may need a lot of storytelling about the paintings to hold their interest, but the statues and reliefs of mythological characters will catch their fancy.



*Sshhh . . . listen to the whispering water.*

Maryann Malarkey, of Ipswich, Massachusetts, received the certificate in landscape design in 1995. For the past twelve years she has designed award-winning landscapes ranging from planting plans for small urban gardens to master plans for historic estates. Over that period, her firm, Alberts Malarkey Designs, has grown into a full-service design-build company known especially for environmentally sensitive landscapes. Upon completion of revisions, Maryann plans to publish *Of Fantasies and Footpaths*.

# LANDSCAPE INSTITUTE

## INDEPENDENT PROJECTS 1981–2006

### 1981

- Lenox, MA, Open Space Plan, *Rebecca De Neri-Zagal*
- Evergreens in the New England Landscape, *Vincent DiColo*
- Two Eighteenth-Century Gardens: William Paca's, Annapolis, MD, and Elias Hasket Derby's, Salem, MA, *Louisa M. Mace*
- Master Plan for Radcliffe Yard, *Patricia Strand*

### 1982

- Fairsted Garden Plans: The Olmsted Office Landscape, *Joanne Emerson*
- Concord River Greenway Plan, Concord to Cambridge, MA, *Anne Hale* & *Minako Henderson*
- A Program for the Renewal of Rock Meadow Conservation Land, Belmont, MA, *B. June Hutchinson*
- Study for Revitalization of Cleveland Circle, Boston, MA, *Barbara Keller*
- Landscape Design and Implementation for the Cambridge School in Weston, MA, *Nina Lavin*
- Massachusetts Avenue, Cambridge, MA, Space Analysis and Commentary, *Margaret Megowan*
- A Program of Renewal for Rock Meadow Conservation Land, Belmont, MA, *Ann Steinberg*

### 1983

- McKinley Square Design, Boston, MA, *Anita Berrizbeitia*
- Audubon North River Sanctuary, Norwell, MA, *Rose Broderick* & *Barbara Cain*
- Rowes Wharf Development Plan, Boston, MA, *Lee Cooke-Childs*

- Ogunquit Green Proposal, ME, *Susan Dean, Ellen Matheson* & *Susan Littleton Murphy*
- Roots: A Creative Intervention in an Urban Space, Boston, MA, *Betty King*
- South Park, Buffalo, NY: An Olmsted Park Inventory & Rehabilitation Study, *Joanne J. Turnbull* & *Arleyn Levee*
- Moses Brown Campus, Providence, RI, Development Plan, *Mary Worrell*

### 1983-1984

- A Town Landscape Planning Proposal for Harrisville, NH, *Ann Carlsmith* & *Caterina Fitzgerald*
- Castle Hill Study & Restoration Proposal, Ipswich, MA, *Jane Crandell-Glass* & *Virginia Hibbard*
- Watertown, MA, Square Revitalization Proposal, *Merrette Ische-de Gruiter* & *Patricia Larkin*
- Showcase Gardens for the Arnold Arboretum's Case Estates, Weston, MA, *Elise Laurenzi* & *Angela Silsby*
- South Shore, MA, Science Center Development Proposal, *Monica A. Luft*
- Andrew Jackson Downing, Cultivator of an American School of Landscape Architecture, *Susan Raslavicus*
- Wollaston Beach Revitalization Plan, Quincy, MA, *Pamela Schooley* & *Elizabeth Cion*
- Master Plan for Moore State Park in Paxton, MA, *Janet Taber* & *Catherine Hodgson*

### 1985-1986

- Waynflete School: Campus Master Plan, Portland, ME, *Eleanor Ames*
- Beverly Farms, MA, Townscape, *Laura Benefield Gibson*
- Frank Lloyd Wright: Landscape Architect,

*Nancy Jarnis*

- Elm Bank Estate, Dover, MA: Adaptive Reuse of a Historic Landscape Plan, *Jane Kittredge* & *Mary Pillsbury*
- Front Street Riverfront Park, New Haven, CT, *Marian La Follette*
- "Plantlist," A Computerized Plant Selection Program, *Susan Saarinen*
- Greenough Boulevard Park on the Charles River, Watertown, MA, *Carol Schein*

### 1987

- The Bay Circuit: A Proposal for Billerica and Tewksbury, MA, *Morag Hollway* & *Jeanine Smith*
- Plan for Marine Park in South Boston, *Ann Gilardi Johnson*
- A Proposal for an Educational Center at the Abbott Campus, Andover, MA, *Phyllis R. Marx* & *Judith F. Wright*
- Gardens of America's Golden Age: Fletcher Steele, Landscape Architect, *Priscilla Urquiola*
- Lincoln Park, Lexington, MA, Development Plan for a Disturbed Site, *Nell McDill Walker*

### 1988

- Mystic Valley Parkway: A Master Plan for a Historic Landscape, MA, *Grenelle Bauer-Scott*
- Winslow Park Master Plan, Freeport, ME, *Carol Burrall*
- Exeter Waterfront Park, Exeter, NH, *Elizabeth Dawson*
- Money, Manure, and Maintenance: The Life & Work of Marion Cruger Coffin, 1876–1957, *Nancy Flemming*
- The Burbank & Winn Brook Schools of Belmont, MA: School Grounds Planning



with Community Input, *Nancy Forbes*  
 Revitalization Proposals for Oak Square,  
 Brighton, MA, *Jody Emerson Howard* &  
*Dee Ramee*  
 Villa by the Sea: A Master Plan, *Cornelia*  
*Hanna McMurtrie*  
 Lynn, MA, Waterfront: Access and  
 Circulation, *John Moberger*  
 The Case Estates of the Arnold Arboretum:  
 A Land-Use and Development Proposal,  
*John C. Quinn* & *Janis S. Wedmore*  
 Symbol and Spirituality in the Landscape,  
*Jenny Wall*

## 1989

East Arlington, MA, Greenspace Linkage  
 Plan, *Kenneth Bastion*  
 Horn Pond Park Plan, Woburn, MA,  
*Catherine Bate*  
 Raphael: Art to Landscape Architecture,  
*Barbara Carpenter*  
 The Garden in Winter, *Pamela Fleming*  
 Gardens for the Elderly, *Joan Kutcher*  
 Acton, MA, Arboretum Master Plan,  
*Beverly LaFoley* & *Sandy Bayne*  
 Jens Jensen: The Natural Impulse & the  
 Prairie as Motif, *Eve F. W. Linn*  
 Borderland State Park Master Plan,  
 Easton/Sharon, MA, *Betsy Mayer, Susan*  
*Stockman* & *Ann Shubert*  
 Long Hill Feasibility Study and the  
 Sedgwick Garden Long Range and  
 Management Plan, *Beverly, MA,*  
*Elizabeth Stone* & *Elizabeth Collier*  
 Cape Herb Farm, Cape Cod, MA, *Sandra*  
*Thibault*  
 Bedford, MA, Riverfront Design Study,  
*Lynn Willscher*  
 Mill Pond & Pipe Stave Hill, Newbury, MA,  
 Master Plan, *Polly Zevin* & *Jane Rupley*

## 1990

A Pastoral Vision Reclaimed: A Preliminary  
 Master Plan for Brook Farm, *Jean*  
*Cavanaugh, Mary Dewart* & *Judy*  
*Stoessel*  
 A Design for Veterans Brickyard Park,  
 Barrington, RI, *Mary G. Glenn*  
 Cultural Landscape Assessment of  
 Governor Thomas Hutchinson's Estate  
 (1742-1774), Milton, MA, *Nina Graves*  
 Virginia Wood, Middlesex Fells  
 Reservation, MA: An Interpretive Plan,  
*Susan Halpern* & *Patricia Starfield*  
 Visions of the Landscape: A Survey of  
 Twentieth-Century Gardens of Rhode  
 Island, *Martha D. Halyburton*  
 Middlesex Fells Reservation MA, Master  
 Plan, *Sandra Jonas* & *Joan Schofield*

The Gardens of the Aztec Kings, as  
 Documented by the Spanish  
 Conquistadors, *Sandra Lopez-Loucel*  
 Public Access to the Water: Gloucester's  
 Inner Harbor, *Mary Lou Nye* & *Sally*  
*Dibble*  
 Master Plan for Linking Open Spaces in  
 Hingham, MA, *Katharine W. Reardon*  
 Crosby Estate at Nickerson State Park,  
 Brewster, MA, *George Reilly*

## 1991

Open Space Plan for Mother Brook,  
 Dedham, MA, *Mary Bush Brown*  
 Long Range Plan for Walnut Hills  
 Cemetery, Brookline, MA, *Janet R.*  
*Childs*  
 Fort Point Channel Design Proposal, Boston,  
 MA, *Linda Dillon* & *Barbara Hulsizer*  
 Master Plan for The Rocks Park,  
 Bethlehem, NH, *Ellen Fisher*  
 Master Plan for Berwick Academy, South  
 Berwick, ME, *Rebecca L. Linney*  
 The Farm: A Transitional Landscape,  
*Wendy Pomeroy*  
 Construction Detail Manual, *Thomas*  
*Schroeder*  
 The Charles River at Cow Island Pond, MA:  
 A Threatened and Underused Natural  
 Resource, *Andrea Taaffe*  
 Master Plan for South Mill Pond,  
 Portsmouth, NH, *Jackie Vaccaro*

## 1992

The Church of the Messiah Landscape  
 Master Plan, Woods Hole, MA, *Dorothy*  
*D. Aspinwall*  
 Master Plan for a New England Landscape  
 by Warren Manning, *Gertrude S. Bancroft*  
 Sudbury Village: Back to the Future,  
*Marylyn M. Benson* & *Kathleen Sargent-*  
*O'Neill*  
 A Charles River Corridor Study from  
 Watertown to Newton, MA, *James H.*  
*Broderick*  
 Rail-to-Trail Recreation and Interpretive  
 Greenway, Dorchester, MA, *Regina C.*  
*Clarke*  
 The Artwork of Christo and Landscape  
 Design: An Overview of Christo's  
 Artwork From 1958-1992 Comparing His  
 Methodology and Philosophy to Those of  
 Landscape Designers, *Liz Goodfellow*  
 A Memorial and Life-Cycle Garden Design  
 for Temple Beth Shalom, Needham, MA,  
*JoAnn Green*  
 Packet Landing Master Plan, North River,  
 Marshfield, MA, *Cynthia H. Mulcahy*  
 Great Falls Park and Newichawannock  
 Trail Plan, Berwick, ME, *Kim E. Myers*

The Commonwealth Avenue Mall, A Master  
 Plan for the Future, *Margaret Pokorny*  
 Palimpsest: A Design Study for a Family  
 Farm in Rhode Island, *Virginia P. Purviance*  
 Kaleidoscapes, A Children's Park and  
 Garden Book, *Lynn S. Schad*  
 Memories of an Industrial Landscape: A  
 Design for Mill Brook, Waterford, ME,  
*Robert W. Spencer, Jr.*  
 Connecting River & Town: Designing a  
 Future for the DPW Site in Concord, MA,  
*Ann Venable*  
 "Seeing Is Forgetting the Name of the  
 Thing One Sees"—An Exploration of  
 Transformation in Landscapes, *Margaret*  
*P. Watson*  
 Design for a Main Street in Transition, Falls  
 City, NE, *Linda Watzke*

## 1993

Martha's Vineyard Bicycle Trail System,  
*Stephanie Sewell Bacon* & *Lynne Miller*  
 A Painter's View of Garden Landscapes and  
 Their Design Inspirations, *Alice*  
*Boardman*  
 Designing Gardens for Seniors, *Hannah*  
*Delfiner*  
 Playground: Planning a Playground for the  
 Driscoll School in Brookline, MA, *Mary*  
*Dennis*  
 Squantum Point Meadow Reserve Plan,  
 Quincy, MA, *Karen Derman*  
 A Landscape Plan for the Gardens on the  
 Hill, Whitinsville, MA, *Barbara Gaudette*  
 A Proposal for Maintaining the Ecology  
 with Increased Use at Storrs Pond,  
 Hanover, NH, *Barbara Gibbs*  
 Imagining Medieval Gardens in Words and  
 Drawings, *Sue Ellen Holbrook*  
 A Master Plan for the Grounds at the House  
 of Seven Gables, Salem, MA: Past,  
 Present, & Future, *Robyn Kanter*  
 A Design for a Cranberry Reservation in  
 Chelmsford and Carlisle, MA, *Cynthia*  
*Kaplan*  
 The Lincoln-Sudbury, MA, Regional High  
 School Landscape Revitalization Plan,  
*Deborah Kruskal*  
 Trees 2000: A Master Plan for the Boston  
 Tree Party, *Deborah McCarthy*  
 Urban Spaces: Strategies for Traffic Island  
 Planting, Boston, MA, *Sally Muspratt*  
 The Habitat Trail Design, New York  
 Botanical Garden, *Carol Taber* &  
*Elizabeth Vestner*  
 Abandoned Rail to Commuter Trail:  
 Wellesley to Newton, MA, *Joanne Weiss*

## 1994

Oxbow Reserve Plan: A Link in the Nashua

- River Greenway, *Kathy Anestis*
- A Room of One's Own: American Garden Writers, 1900-1940, *Virginia Begg*
- Landscape Rehabilitation Plan for the Codman Estate, Lincoln, MA, *Philip E. Bevins*
- A Study of Charles River Access and Experience, Waltham, MA, *Susan Brown*
- Japanese Theory/American Sensibility: A Video, *Lynne Butler*
- A Landscape Plan for the DeCordova and Dana Museum and Sculpture Park, Abigail Congdon
- Designing Nature Trails Between the Osgood and Deer Hill Schools, Cohasset, MA, *Margaret Cotter*
- Creating a Landscape Design Heritage: Conversations with Designers and Preservationists, *Claudia Everest*
- Through the Mind's Eye, a Touch of Sensibility: Garden Designs for the Visually Impaired, *Laura Gallant*
- Use of Geometry as a Landscape Design Methodology, *Diane Gilbert-Lints*
- Boston's South End Squares, Inventory, Analysis, and Recommendations, *Phebe S. Goodman*
- An Inventory and History of Baroque Gardens in the Czech Republic, *Jan Hendrych*
- Campus Master Plan for Gettysburg College, PA, *Patricia W. Henry*
- A Better Acre: A Master Plan for the Fletcher Street Corridor Through the Acre Neighborhood of Lowell, MA, *Rosalie Johnson*
- Winchester, MA, Public Library Master Plan, *Julie Khuen*
- A Plan for Great Brook State Park, Carlisle, MA, *Eunice Knight*
- A Room of One's Own: American Garden Writers, 1900-1940, *Virginia Nemerever*
- A Design for the Highland Park Greenway, Boston, MA, *Molly Paul*
- Codman Estate Maintenance Program Analysis, *George Riley*
- A Plan for the Ipswich Riverwalk Extension, Ipswich, MA, *Mary Shattuck*
- Luis Barragan: Philosophy and Selected Work, *Colleen Thornton*
- Sudbury Commons: A Master Plan for the Historic Town Center, *Maria von Brincken*
- 1995**
- Special Holding Places, Room for Recovery: A Master Plan for the Community Therapeutic Day School, *Patricia A. Bras*
- Wildlife Habitat Enhancement in Somerville's Open Space, MA, *Leslie Brayton*
- The Pilgrim Monument and Provincetown, MA, Museum Design Study, *Laurie Carney*
- Design Principles and Concepts Video for a General Audience, *Lucia Droby*
- A Play-for-All Park at Poor Farm, A Handicapped Accessible Multi-Use Recreational Park in New Bedford, MA, *Eleanor Sue Fairfax*
- The Art of Landscape Design for Television Audiences, *Natasha Hopkinson*
- Boxford Woods, Boxford, MA, Master Plan, *Marcia Imbrescia*
- York River, ME, Open Space Plan, *Heidi Kost-Gross*
- New Scabury, MA, Country Club: A Master Plan, *Mary LeBlanc*
- Middleton, MA, Open Space Plan, *Sally Macdonald*
- Of Fantasies and Footpaths: Seven Landscapes to Enjoy With Children, *Maryann Alberts Malarkey*
- A Redesign for the Boston City Hall Plaza, *David McCoy*
- A Look at Small Urban Neighborhood Parks in Somerville, MA, and How They Work, *Lynn McWhood*
- Cashman Park on the Newburyport, MA, Waterfront, *Lillian Newbert*
- A Design Plan for the Wellesley, MA, Rhododendron Botanical Park, *Kristen Vlass*
- Transitional Spaces in Italian Renaissance Gardens, *Kathleen Warren*
- Papillon Park Design, Westford, MA, *Lorraine Wright*
- Jetties Beach: A Park on Nantucket, MA, *Anneliese Zion-Hrones*
- 1996**
- The Paine Estate: A Development Plan, Wayland, MA, *Mary Beard*
- Schooner Park Development Plan, Duxbury, MA, *Jill Blackburn*
- Revision of the Bay Circuit Open Space and Recreation Plan for Sherborn, MA, *E. Louise Forrest*
- Plaza Del Sol Streetscape for Lechmere Canal Area, Cambridge, MA, *Carolina Fungairin*
- A Landscape Master Plan for Cambridge, MA, Friends School, *Alice Evans*
- Design for Common Places in the Town of Brookline, MA, *Alan Friedman*
- Linking People with Plants: A Master Plan for the Pine Tree State Arboretum, Augusta, ME, *Pamela Griffin*
- A Study of Louis Kahn's Salk Institute Landscape, La Jolla, CA, *Sarah Jolliffe*
- A Study of New Hampshire Gardens Designed Before 1950, *Jill Nooney*
- Commonwealth Avenue Urban Design Proposal, Boston, *Victoria Schwab*
- The Dome Community Garden Design, NYC, *Elizabeth Tegen*
- Landscape Plan for the Congregational Church of Topsfield, MA, *Edith Ventimiglia*
- A Master Plan and Design for Grandmother's Garden, Chauncey Allen Park, Westfield, MA, *Anne C. Wellington*
- 1997**
- Life Space in the Private Landscape: Designing Experience and Memory in the Quiet Garden, *Monique M. Papazian Allan*
- A Plan for Rogers Fort Hill Park, Lowell, MA, *Ellen Coppinger*
- A Preservation Plan for the Ropes Mansion Garden, Peabody Essex Museum, Salem, MA, *Frances Doyle*
- The Martha's Vineyard, MA, Arboretum: The Legacy of Polly Hill, *Margaret H. Early*
- Private Pleasures Derived From Tradition: The Hunnewell Estates District, Wellesley, MA, *Allyson M. Hayward*
- The Dynamics of George E. Kessler: Park Landscape Architect and City Planner, *Nancy Hubert*
- Adaptive Re-use Landscape Guidelines for the Crane Estate, Ipswich, MA, *Denise King*
- The Green Prince: Hermann Von Pueckler-Muskau and His Legacy, *Heidi Kost-Gross*
- Designing a Celebration of History: Fort Revere, Hull, MA, *Kristin McCarthy*
- The Conservation, Restoration, and Enhancement of the Germany Brook Headwaters, Westwood, MA, *John J. O'Toole III*
- 73 Dascomb Road Site Plan: A Nineteenth-Century Residential Landscape in Its Ecological Profile, Andover, MA, *Diane M. Pitochelli*
- Den Rock Park Study, Lawrence, MA, *Lori A. Poel-Piazza*
- Ashumet Holly and Wildlife Sanctuary: Unifying an Accessible Landscape, Falmouth, MA, *Marie Potter*
- The Design for the Russian-American Business Center, Bridgton, ME, *Anne H. Radway*
- Garden Photography in the Country Place Era: The Work of Mattie Edwards Hewitt, *Terri Ann Rochon*
- Site Improvement Plan for Martin Luther King Elementary School, Cambridge, MA, *Sophie Salerno*
- The Search for a Sixteenth-Century Hindu



- Landscape, Braj, India, *Behula Shah*  
 Proposed Site Plan for the Rogers High School Campus, Newport, RI, *Julia Rush Toland*  
 The Windsor Dam Promenade, Quabbin Reservoir, MA, *Ann Townsend*  
 Landscape Plan for the Observatory LIGO, MA, *Elizabeth Vickers*  
 The Twenty-First Century at Elm Bank, Dover, MA, *Caroline Whitney*  
 Skunknet Nature Center: A Window into Cape Cod, MA, Ecology, *Pamela Whiteley*

## 1998

- Modern Residential Garden Designs, *Robin Bouyer*  
 Gardens of Innocence and Experience: Landscape in the Literature of Childhood, *Nancy Butman*  
 The North 40: A Development Study, Wellesley, MA, *Alison Campbell*  
 Making the Connection: The History, Influence, and Future of the Greenway Movement, *R. Jill Chamberlain*  
 A Therapeutic Landscape Design for the Greenways Community, MA, *Susan Foley*  
 The Natick, MA, Community Organic Farm: The Land as Community, *Barbara J. Karski*  
 Wildlife Landscaping for Homeowners, *Julie Lisk*  
 Memories of a Bamboo Grove, Wakamatsu Park, Kobe, Japan, *Ireine Nagai*  
 Tee Time for Migratory Songbirds: An Environmental Plan for the Widow's Walk Golf Course, Scituate, MA, *Philip Racicot*  
 Therapeutic Landscape Design Guidelines for Special Needs Facilities, *Judith Reeve*  
 Brookline's Small Parks: Circles, Triangles, Median Strips, *Alya Shklovskaya*  
 Landscape Resource Center of Boston: A Website for Landscape Designers, *Anne Smith*  
 Gardens of Chinese Inspiration, *Marie Stella*  
 Landscape as Processing: The Offered Journey, *Claire Tague*  
 Master Plan for Egremont Inn, Egremont, MA, *Joshua Taufman*  
 A Master Plan for the McLean Hospital Landscape, Belmont, MA: A Contemporary Interpretation of the Sublime, *Diana Thomas*  
 A Master Plan for Spot Pond, Middlesex Fells, MA, *Christopher Tinkham*  
 A Therapeutic Garden at the Veterans Administration Hospital, Brockton, MA, *Michael Toomey*

The Ruin and the Garden: The Interstices of Stone and Leaf, *Ann Uppington*

The Doyle Reservation, Leominster, MA: From Private Estate to Public Trust, *Linda Willoughby*

On Common Ground: A Master Plan for Faulkner Farm, Brookline, MA, *Dale Wilson*

## 1999

- A Landscape Design for Tierra Verde Community Center, FL, *Carolyn Berger*  
 Leland Mill Reservation Restoration Plan: History Remembered/ Nature Enjoyed, Sherborn, MA, *Thurza Campbell*  
 Dedham, MA, Town Center Master Plan, *Marcia N. Damon*  
 Reflections in Stone, A Guide to the Use of Stone in the Garden, *A. David Davis*  
 Stilts, Stones, and Sand—Landscape Design at the Ocean's Edge, Cape Cod, MA, *Susannah Davis*  
 Reflections of History: Bradford Riverwalk Design, Haverhill, MA, *Nancy Hollis*  
 A Preservation Plan for Canton Corner Cemetery, Canton, MA, *Kathleen Keith*  
 The Olmsted Brothers' "Broadfields": A Preservation Project, North Andover, MA, *Kyle Lunn*  
 The Colonial Garden on the Common, Lynnfield, MA, *Joanne Paul*

A Rehabilitation Plan for the Orchard on Thompson Island, Boston, MA, *Deborah Rivers*

A Design for "Homewood," A Wooded Cape Family Retreat, Osterville, MA, *Maureen Spillane*

Master Plan for the Providence, RI, Zen Center: Gardens of Nameless Being, *Nathan Wilbur*

## 2000

- Shelticote: Sharing in a Virginia Landscape, *Paula Berardi*  
 A Restoration Plan for the French Garden at the Stevens-Coolidge Place, MA, *Laura Bibler*  
 The Legacy of Robert Smithson, *Patricia Fuller*  
 A Design Plan for Oak Ridge Cemetery, Dennis, MA, *Shannon R. Goheen-Huettner*  
 The Hidden Gardens of Harvard, 1600-2000, *Paige Jarvis Mercer*  
 A Design for the Hoft Farm Habitat Garden, Martha's Vineyard, MA, *Melissa Morrison*  
 In and Out of the Garden: Paintings and Drawings, *Diane Nicholls*  
 A Master Plan for Glen Urquhart School, Beverly Farms, MA, *Diana Peck*  
 Willowdale: A Suburban Development

Proposal, MA, *Virginia Rogers*

An Environmental Sourcebook for Concord, MA, *Tracy Greene Sharakan*

The Lake in Our Hearts: A Park on the Shore of Lake Massapoag, Sharon, MA, *Amanda Sloan*

Nan Fairbrother: Life, Language, Landscape, *Faith Smith*

Rinnerroon—Creating a Celtic Garden in an Irish Landscape, *Karin Stanley*

Little River Park, NH: Rejuvenation of a Damaged Landscape, *Karen Wakefield*

The Renewal of a Town Center: Topsfield, MA, *Maria Wheeler*

## 2001

Wakefield's Emerald Necklace: Landscape Design Plans for a Passive Park at Lake Quannapowitt, Wakefield, MA, *Pattiann Banipos*

A Streetscape Improvement Plan for the Village of Stowe, VT, *Juliet Barash*

Unitarian Universalist Rowe Camp and Conference Center Master Plan, Rowe, MA, *Prudence Barry*

An Interpretive History of "Skylands," A Jens Jensen Landscape in Maine, *Jane Roy Brown*

Restoration of the Peach Wall at the Lyman Estate, Waltham, MA, *Carol Michener Card*

Design of Hayward Place, Chinatown, Boston, MA, *Elizabeth Carey*

Dong-Ping Forest Park Expansion Plan: An Ecological and Cultural Study, Cong-Ming Island, Shanghai, China, *Yo Yi Chen*

Constructing a New Edge: The Sewall Shipyard and Waterfront Park, Bath, ME, *Catherine Davis-Massey*

A Design for Breckinridge Park, York, ME, *Caroline Donnelly*

Horticultural Recommendations for Larz Anderson Park Master Plan, Brookline, MA, *James Farnsworth*

Landscape for Living in Public Housing, Dorchester, MA, *Judith Lipson-Rubin*

Salt Sea Lane—A Restorative Landscape for Seniors, Falmouth, MA, *Frances McClennen*

Italian Renaissance, French Grand Style, and Modern: Three Landscape Design Styles Adapted for a Contemporary Home, *Maureen Meinert*

Reclaiming Walden: A Narrative of a Damaged Landscape and Recommendations for the Re-Use of the Concord Landfill, Concord, MA, *Joan Popolo*

Coolley Dickinson Hospital: A Design for Art and Healing, Northampton, MA, *Janis Porter*

A Master Plan for the Use of Public Land at

the Covered Bridge Crossing the Nashua River, Pepperell, MA, *Margaret-Ann Rice*

The Influence of Modern Designers on Residential Design, *Richard Russell*

Fenwick Gardens: Landscapes for Affordable Housing, Dorchester, MA, *Nina Shippen*

A Design for the Lahey Clinic Healing Gardens, Burlington, MA, *Catherine Wiersema*

Harlem Valley Rail Trail Design—Fostering Connections, Millertown, NY, *Jill Wentorf Wright*

Dolan Pond Conservation Area: A Plan for Revitalizing an Urban Wetland, Margo Young

## 2002

Roots of Learning: A Landscape Master Plan for Machon Elementary School, Swampscott, MA, *Susan Balleza*

Veteran's Memorial Park Revitalization Plan, Old Orchard Beach Park, ME, *Andrea Berlin*

A Cornish Garden Design Project, NH, *James Brown*

Master Plan for the Gundlach Bundschu Winery of Sonoma, California, *Eunice Burley*

The Gerry Playground: Renewing the Natural Landscape, Marblehead, MA, *Alexandra Carr*

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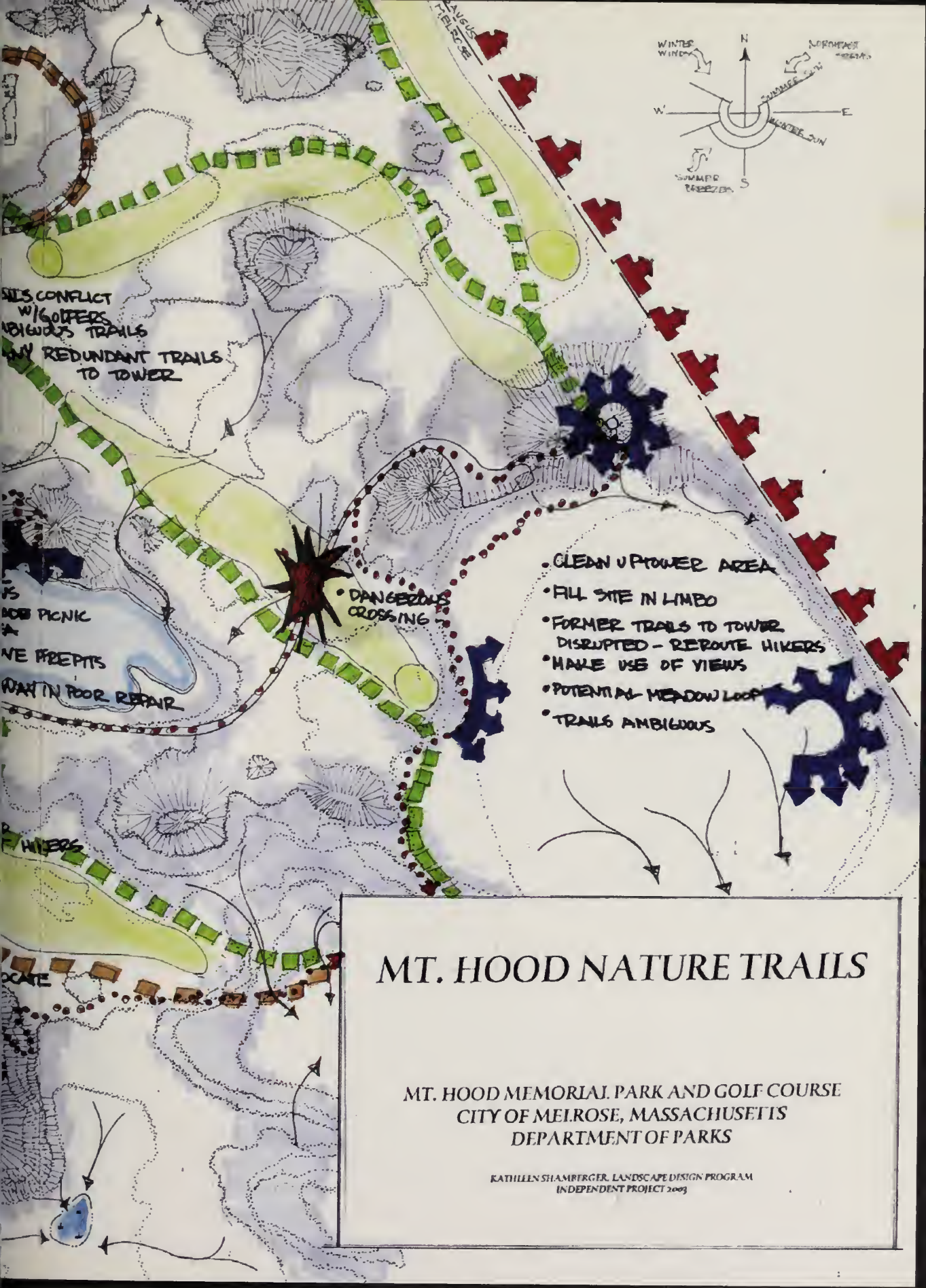
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SILS CONFLICT  
W/ GOLFER'S  
AMBIGUOUS TRAILS  
REDUNDANT TRAILS  
TO TOWER

IS BOB PICKIN  
NE PREPITS  
WANT IN POOR REPAIR

WILBERS

OCATE

DANGEROUS  
CROSSING

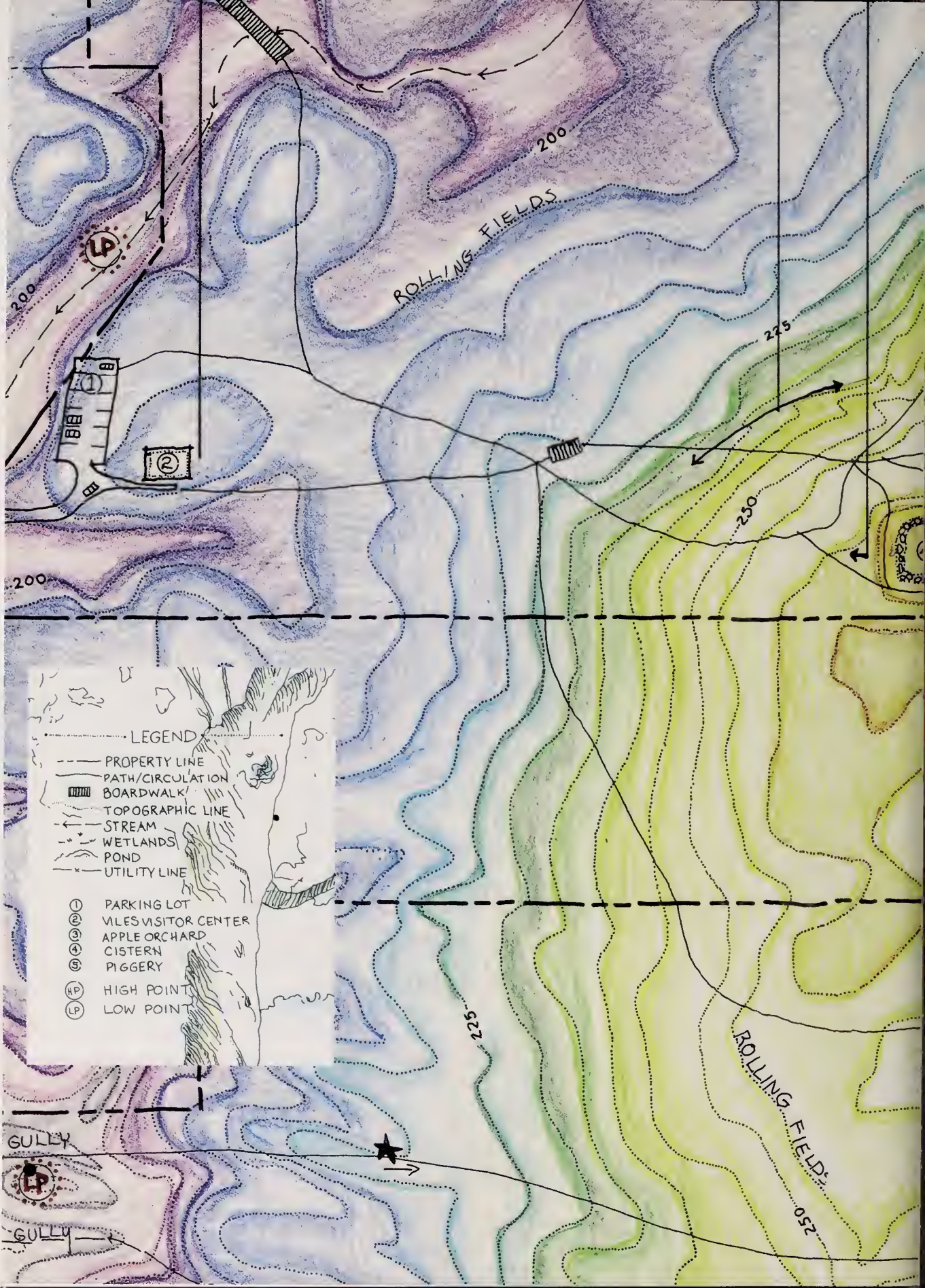
- CLEAN UP TOWER AREA
- FILL SITE IN LIMBO
- FORMER TRAILS TO TOWER  
DISRUPTED - REROUTE HIKERS
- MAKE USE OF VIEWS
- POTENTIAL MEADOW LOOP
- TRAILS AMBIGUOUS

# MT. HOOD NATURE TRAILS

MT. HOOD MEMORIAL PARK AND GOLF COURSE  
CITY OF MELROSE, MASSACHUSETTS  
DEPARTMENT OF PARKS

KATHLEEN SHAMBERGER, LANDSCAPE DESIGN PROGRAM  
INDEPENDENT PROJECT 2003





LEGEND

- PROPERTY LINE
- PATH/CIRCULATION
- BOARDWALK
- TOPOGRAPHIC LINE
- STREAM
- WETLANDS
- POND
- UTILITY LINE

- ① PARKING LOT
- ② VILES VISITOR CENTER
- ③ APPLE ORCHARD
- ④ CISTERN
- ⑤ PIGGERY
- HP HIGH POINT
- LP LOW POINT





